

DISTRICT OF COLUMBIA

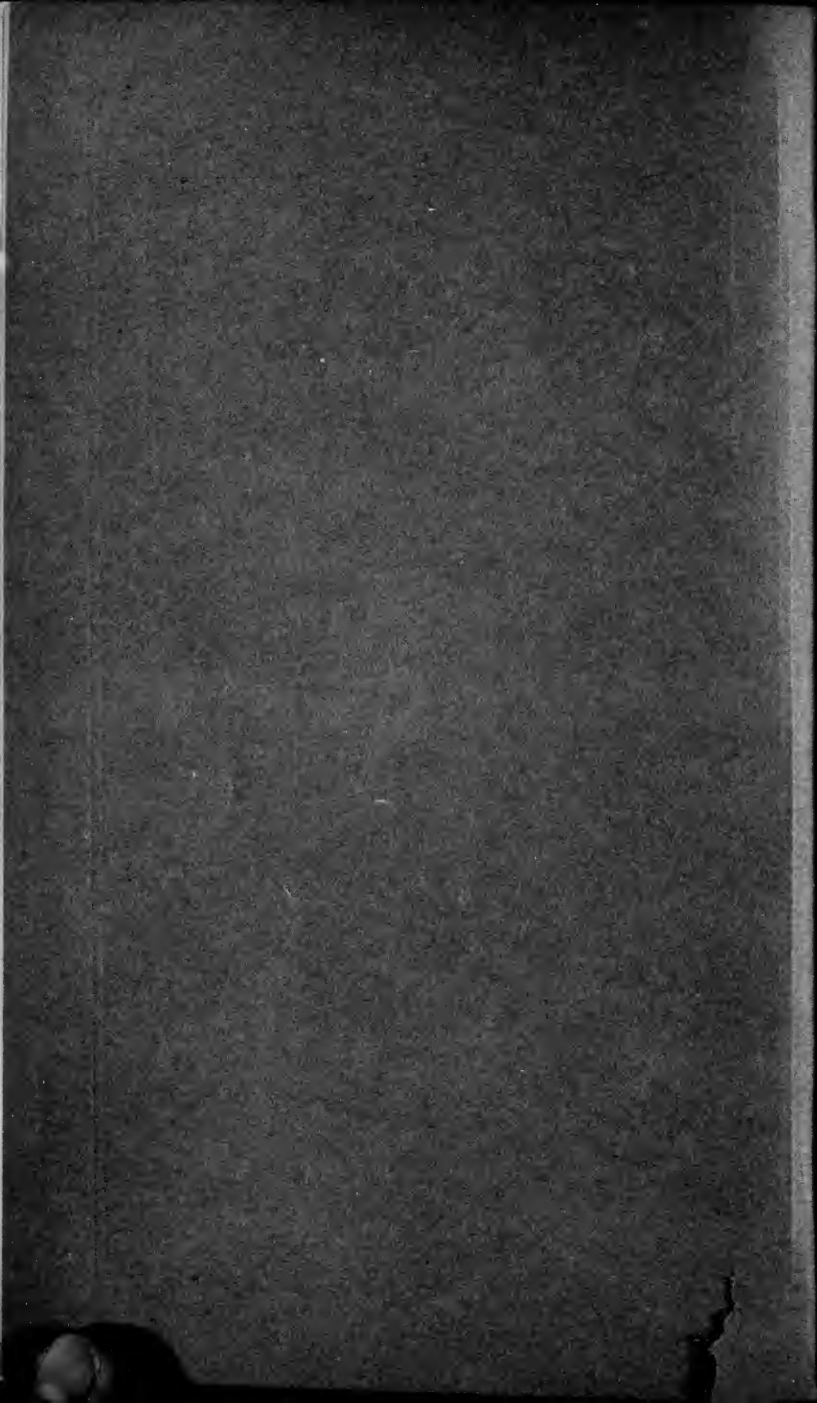
THE OPERATIONS OF THE
ENGINEER DEPARTMENT
DISTRICT OF COLUMBIA

YEAR ENDED JUNE 30, 1929

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WASHINGTON



REPORT
OF THE OPERATIONS OF THE
ENGINEER DEPARTMENT
OF THE DISTRICT OF COLUMBIA

FOR THE YEAR ENDED
JUNE 30
1929

UNDER THE DIRECTION OF
COLONEL WILLIAM B. LADUE

Corps of Engineers, United States Army
Engineer Commissioner, District of Columbia



UNITED STATES
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Maj. LAYSON E. ATKINS, *Corps of Engineers, United States Army, Assistant.*
Capt. HUGH P. ORAM, *Corps of Engineers, United States Army, Assistant.*

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T. L. COSTIGAN, *Superintendent of Street Cleaning.*

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JOHN A. LONG, *Engineer in Charge, District of Columbia Repair Shop.*

DISTRICT BUILDING:

E. P. BROOKE, *Assistant Superintendent.*

LAND, PURCHASE OF.

MUNICIPAL GARAGE AND DISTRICT OF COLUMBIA AUTO REPAIR AND PAINT SHOPS:

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CHARLES N. EMMONS, *Superintendent, Municipal Garage.*

UNDER THE IMMEDIATE SUPERVISION OF CAPTAIN ORAM

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J. A. DARE, *Construction Engineer.*

F. M. DAVISON, *Engineer of Maintenance.*

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TREES AND PARKINGS DEPARTMENT:

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J. S. GARLAND, *Superintendent.*

E. H. GROVE, *Water Registrar.*

EXTRACT FROM REPORT OF THE COMMISSIONERS OF THE DISTRICT OF COLUMBIA FOR THE FISCAL YEAR ENDED JUNE 30, 1929

OFFICE OF THE COMMISSIONERS
OF THE DISTRICT OF COLUMBIA,
Washington, December 2, 1929.

To the Senate and House of Representatives of the United States of
America in Congress assembled:

The Commissioners of the District of Columbia herewith submit
for the information of Congress, pursuant to the requirements of
section 12 of an act providing a permanent form of government for
the District of Columbia, approved June 11, 1878 (20 U. S. Stats.
108), a report of the official doings of that government for the fiscal
year ended June 30, 1929.

ROADWAY PAVEMENTS

The accompanying table shows the area in square yards of new
roadway pavements laid and old roadway pavements resurfaced dur-
ing the year, with the total in square yards and miles of the various
kinds of pavements at the close of the fiscal year.

Comparative statement showing character and extent of roadway pavements

	Existing amount on June 30, 1928		New pave- ments laid during year (square yards)	Pavements replaced during year (square yards)	Existing amount on June 30, 1929	
	Square yards	Miles			Square yards	Miles
Sheet asphalt and coal tar.....	3, 595, 508	191. 77	12, 911	¹ 25, 908	3, 582, 511	191. 19
Asphalt block.....	532, 594	26. 94		² 12, 911 ³ 33, 085 ⁴ 5, 275	481, 323	24. 37
Asphaltic surface.....	265, 736	16. 86	36, 041		301, 777	18. 68
Miscellaneous pavements.....	5, 931	. 23	⁴ 114, 598		120, 529	7. 29
Durax block.....	31, 679	1. 13			31, 679	1. 13
Asphaltic or bituminous concrete:						
On concrete base.....	76, 302	4. 28			76, 302	4. 28
On stone base.....	38, 909	2. 16			38, 909	2. 16
Cement concrete.....	1, 181, 372	63. 08	⁵ 62, 332 268, 645	⁶ 2, 067 ⁶ 10, 115 ⁷ 889	⁶ 1, 500, 167	81. 67
Granite block or rubble.....	241, 474	13. 76		⁶ 8, 450	232, 135	13. 33
Vitrified block.....	17, 390	1. 04			17, 390	1. 04
Cobble.....	36, 374	1. 52			36, 374	1. 52
Macadam (estimated).....	1, 503, 717	102. 95		¹ 42, 901 ⁶ 96, 033	1, 364, 783	94. 66
Gravel and unimproved (estimated).....		179. 83				182. 53
Gutters on asphalt streets.....	256, 929		840		257, 769	
Pavements maintained by street railways.....	616, 807				616, 807	
Gutters on asphaltic concrete.....	9, 723				9, 723	
Total.....	8, 410, 445	605. 55	495, 367	237, 634	8, 668, 178	623. 85

¹ Replaced with cement concrete.

² Replaced with sheet asphalt.

³ Replaced with asphaltic surface.

⁴ 101,598 square yards asphaltic concrete (concrete, granite block, and macadam base); 13,190 square yards asphaltic covering (concrete and granite block base); total, 114,598.

⁵ Whole cost yardage.

⁶ Replaced with miscellaneous pavement.

ROADWAY CONSTRUCTION

The field of activity of the year's work was well balanced. The average of the asphalt pavements resurfaced was in excess of 29 years. This latter activity comprised 84 items, over half of which were performed by the heater and cover methods. The construction of new roadways comprised 100 items, while there were 6 roadway widening items.

ROADWAY MAINTENANCE

Improved organization and processes for roadway maintenance were a pronounced characteristic of the year's work, resulting in economy of upkeep under the continually increasing stress of motor traffic and in an increase in public safety and convenience in the greater promptness of repairs. The processes of repairing cuts made for underground installations were changed from force account to contract.

BRIDGES

Structures under the control of the commissioners were continuously maintained, including the laying of new floors on the Chain Bridge, Pierce Mill Bridge, and Twentieth Street Bridge over Piney Branch. A new bridge was constructed at Military Road over Rock Creek. A new floor system and roadway surface was installed on the Highway Bridge across the Potomac River. The reconstruction of the M Street Bridge across Rock Creek was placed under contract and work thereon was commenced. The rebuilding of the Virginia abutment of the Chain Bridge was completed.

INSPECTION OF ASPHALTS AND CEMENTS

Chemical and physical tests were made of engineering construction material to the amount of 2,860. Core drill samples of concrete pavements were systematically made, and latterly sample concrete beam tests of these pavements were made to establish individual curing times for the pavements and to determine the earliest safe date for the opening of each thoroughfare to traffic.

COORDINATION OF SURFACE AND SUBSURFACE WORK

The organization for the coordination of surface and subsurface projects in connection with the public works was completed during the latter part of the fiscal year. The system, while in operation during only the last two and one-half months of the year, made possible the more orderly prosecution of highway and underground projects, reflecting a decided saving to District departments and public-utility corporations.

This new procedure includes the positive accomplishment prior to the new paving or the repaving of a street or alley of all underground installations within the area of the work that are to be or should be made, including notice to each individual abutting property owner and request for his cooperation in respect to private service connections, as well as posted notices to like effect on the street to be paved.

Applications for street openings and cuts in existing pavements and for extension of underground systems and service connections have been studied and held to a minimum consistent with progress, growth, and demand. All projects, other than those of a minor nature, and service connections were assigned, upon application, time for prosecution so as to avoid undue congestion or conflict in the carrying out of a large construction program by many different agencies.

This detail was put into operation shortly after the start of the construction season (on April 15, 1929), and from then to the end of the fiscal year 733 applications were approved and issued—442 to District departments and 291 to public-utility corporations.

SURVEYOR'S OFFICE

The work of the surveyor's office is divided into three classes:

1. Work performed for private parties for which fees are charged as prescribed by the commissioners.
2. Work for various departments of the Federal and District Governments for which no fees are charged.
3. Work done in connection with condemnation of land for streets, alleys, parks, school and playground sites, etc.

SUBDIVISIONS

There has been an increase in subdivision work over the previous year. The recording of these subdivisions has created many new streets, squares, and lots. Owing to drainage and grade matters and also zoning regulations, careful cooperation between the various departments of the District is essential.

STREET EXTENSIONS

During the past year 51 streets were affected by condemnation or dedication, portions of which were thereby acquired and placed upon the record books of the surveyor's office, these not including street areas acquired by subdivision.

CONDEMNATION OF STREETS, ROADS, ALLEYS, AND SMALL PARKS

The appropriation of \$5,000 for this purpose should be substantially increased. It has been found very advantageous in the purchase of small parcels for the widening of streets and alleys for drainage purposes and the widening of sharp turns at intersections, but is entirely too small for the acquisition of park land.

HIGHWAY PLAN

The work of this office is constantly increasing. In connection with the opening of streets in accordance with the highway plan, it frequently develops that parcels of land are so cut that the remaining parcels are of little value. It is believed that the commissioners should have authority granted for excess condemnation. This, of course, would require legislation.

CONDEMNATION PROCEEDINGS

During the past year there were 45 condemnation cases pending in court, of which 37 were for streets, parks, school and playground sites, and 8 for alleys. Five cases were confirmed by the court, 4 being alley cases. The total amount awarded as damages for the condemnations confirmed, plus court costs, was \$17,205.14 and the total amount assessed as benefits \$17,205.76.

PROPERTY OWNED BY THE DISTRICT OF COLUMBIA

This office has on file approximately 2,000 deeds from private parties to the District of Columbia for school and playground property, rights of way for sewer and water mains, etc., and the number is being increased annually. There is no record in map form of this property owned by the District. The property should be platted in books of record. This work would require an appropriation for necessary services and supplies.

TREES AND PARKING

The number of trees planted along the curbs on the streets in the District of Columbia at the close of the fiscal year was 108,759, a net increase of 2,194 trees. During the fiscal year 4,238 young trees were planted in their permanent positions. The work of extending the tree system in the suburbs and hitherto unplanted localities resulted in 2,247 young trees being planted along many improved thoroughfares. The sum of \$30,717.42 was expended for labor and material to plant trees.

A total of 2,468 trees were removed during the year for various reasons. A majority of these trees stood at the curb line. The cost of removing 1,786 trees was paid from the appropriation for the trees and parking department at a total cost of \$13,290.31. One hundred and thirty-two trees were removed by private individuals under authority of permits granted by the District, without cost to public funds. The cost of other trees removed was paid from the appropriations for other departments and whole cost deposits.

One thousand eight hundred and sixty-three sycamore maple, 2,223 sugar maple, 1,099 Norway maple, and 684 American elm seedlings were transplanted at Fort Dupont nursery and 3,045 sycamore maple, 1,865 sugar maple, 827 gingko, 2,487 American elm, 415 Japanese elm, 840 sweet gum, 714 red oak, and 1,048 Spanish water oak seedlings at the Poplar Point nursery. The sum of \$14,616.64 was expended for labor, teams, fertilizer, etc. for nursery work.

During the year 14,737 trees were trimmed at a total cost of \$12,252.10. The removal of broken limbs, trees, etc., from the streets caused by storms resulted in an expenditure of \$1,540.94.

Thirty-five thousand nine hundred and seventy-eight trees were sprayed for the extermination of leaf-eating insects, at a total cost of \$2,458.92. One thousand eight hundred and eleven trees were sprayed for the extermination of scale, at a total cost of \$267.60.

The cultivation of 21,809 young trees involved the expenditure of \$4,865.51.

The removal of weeds from uninclosed public parking and tree spaces was undertaken at a total cost of \$4,569.54.

The sum of \$483.10 was expended in treating the cavities in 11 elm, 3 Norway maple, 4 sugar maple, 8 linden, and 4 pin oak trees that stood at the curb line and 2 silver maple trees that stood in the public parking.

The height of 456 retaining walls was passed on, and 751 permits were issued affecting the grade of the parking in connection with building operations in the residential districts.

COLLECTION AND DISPOSAL OF CITY REFUSE

For the fiscal year just ended the appropriation for street cleaning was \$500,000 and that for the removal of refuse was \$950,000.

The amount of miscellaneous refuse to be collected and disposed of is increasing yearly, and the nuisance arising from burning this material on the dumps became so great this past year as to necessitate the elimination of this method of disposal in the District and the operation of the trash-disposal plant during the night as well as during the day for the greater part of the year. This method of disposal and the operation of two shifts added materially to the cost of this work, and it also has been a severe strain on the furnaces and mechanical appliances at the plant, but the resulting freedom from smoke on the property adjacent to the dumps, where refuse formerly was burned, justified the additional cost. The incinerators authorized by act of Congress approved March 4, 1929, are an urgent necessity, and it is hoped that funds for their construction will be made available soon after the Congress convenes in December.

The garbage-disposal plant produced 2,786,079 pounds of grease, which sold for \$195,203.77. A considerable amount of work, costing over \$8,000, was done at Cherry Hill, Va., in the way of substantial repairs and betterments to this plant. It is expected to continue this work during the coming year.

During the past season it was found necessary to dispose of a considerable amount of trash and street-cleaning material collected by hauling to dumps in Virginia. In all of the several services of this department it is becoming increasingly important to do away with horse-drawn vehicles and to substitute motor trucks. The animals we have are getting too old for heavy work, and the hauls to the disposal points have become too long for their satisfactory and economic use. In another year or two it is believed the department should be entirely motorized.

From the appropriation for street cleaning \$12,244.57 was expended last winter for clearing the streets of snow. Two small mechanical snow loaders were purchased and operated successfully.

A general increase in wages was recommended by the wage board and granted the per diem employees during the year. Notwithstanding this increased cost for labor, the work was carried on in increased amounts, and the unit cost of the various methods of cleaning and of the other services were kept at a favorable figure.

BUILDING OPERATIONS

The estimated value of building operations during the year was \$47,743,195, an increase of \$10,007,025 as compared with the previous year. The increase may be attributed in a large measure to the numerous large projects and the resumption on a smaller scale of speculative building.

The number of permits issued was 9,620, an insignificant decrease of 182 as compared with the previous year. Business buildings numbered 247, whereas there were 580 in 1928. The number of apartments was 70, as against 59, and that of dwellings 1,423, as compared with 1,539 for the previous year. The total number of new buildings was 1,740, as compared with 2,178 in 1928. The number of repairs was 6,015, as compared with 5,019 for the previous year.

Permits for signs issued numbered 1,629, as compared with 1,651 for the previous year.

There were 2,993 triyearly inspections of elevators, an increase of 304, as compared with last year. Checks totaling \$3,508.75 were received, paying for 2,807 inspections. There were 973 licenses issued to the operators of elevators. The number of new installations approved for use during this period totaled 120.

There were 5,669 certificates of occupancy issued, an increase of 2,490 as compared with the figure of last year of 3,179. These certificates were a source of revenue in the amount of \$5,384.

The total number of inspections of fire escapes, apartments, fire equipment, places of public assemblage, entertainments, etc., was 2,651, while the fees collected were \$1,458.

The amount collected in fees from the operation of the building inspection division was \$65,627.50, an increase of \$3,859.75, as compared with the previous year, while the total expenditure, including salaries, was \$125,088.82.

PLUMBING AND PLUMBING INSPECTIONS

There were 52,160 inspections during the year by the plumbing inspection division, slightly less than during the previous fiscal year. There were, however, increased number of inspections on plumbing construction work proper, but the number of inspections on complaint work, such as leaky roofs, defective rain leaders, improper surface drainage, and wet cellars, showed a very decided decline.

PLUMBING BOARD

The plumbing board held 23 meetings and examined 85 candidates for licenses as master plumber and gas fitter, of whom 11 passed and were granted licenses.

At the close of the year there were 276 licensed as master plumbers and gas fitters and 6 licensed as master gas fitters only.

PUBLIC CONVENIENCE STATIONS

Four public convenience stations were operated 18 hours daily throughout the year. It is estimated that the facilities of the stations were used about thirteen and one-half million times during the year.

The cash receipts through the use of pay compartments, telephone commissions, public scales, shoe-shining machines, etc., amounted to \$5,562.73, about 20 per cent of the cost of the operation of the stations.

INSPECTION OF STEAM BOILERS

Nine hundred and sixteen steam boilers were inspected by the inspector of steam boilers, including 73 boilers belonging to the District of Columbia. Eight boilers were condemned as unfit for use. The compensation of the inspector of steam boilers is paid from the fees collected from owners of boilers, but no fees were received for inspecting boilers for the District of Columbia. The total amount of fees recorded was \$4,215 and the expense of inspection \$781.55, leaving a net compensation of \$3,433.45 for the inspector.

EXAMINATION OF STEAM ENGINEERS

The board of examiners of steam engineers held 50 meetings and examined 497 applicants, of whom 368 were found competent and 129 incompetent. Of the 368 found competent, 175 related to licenses issued for the operation of gas-fired pressing machines.

CONDEMNATION OF INSANITARY BUILDINGS

During the past fiscal year the board for the condemnation of insanitary buildings held 6 meetings and served 251 condemnation orders. Eight hundred and twenty-seven buildings were examined, of which 136 were razed and 263 repaired, while on 185 no action was taken. Seventy cases are pending. One hundred and seventy-three cases were held for future action of the board.

Repairs to the estimated value of \$71,330 were made and approximately 1,180 occupants were benefited by such repairs. Eight hundred and sixteen persons were required to secure other living quarters through action of the board.

CONSTRUCTION OF MUNICIPAL BUILDINGS

During the year 21 buildings were under construction, as follows: McKinley High School, including auditorium, gymnasium, and power house, which was completed September 14, 1928; contract for the construction of a stadium and improvement of roads, walks, etc., at this school will be completed May 1, 1930; Gallinger Municipal Hospital, which was completed May 15, 1929; Gordon Junior High School, which was completed November 3, 1928; 8-room addition to the Barnard School, including gymnasium and assembly hall, which was completed September 6, 1928; Garnet-Patterson Junior High School, which was completed December 19, 1928; Potomac Heights School, 4-room extensible building, which was completed November 1, 1928; 8-room addition to the Margaret Murray Washington Vocational School, which was completed December 13, 1928; District Training School, construction of two additional dormitories, cow barn, hayloft and equipment, implement and tool house, which were completed April 3, 1929; contract for construction of a steel-girder bridge across Little Patuxent River at the above-named

school was completed April 1, 1929; construction of an addition to the electrical department storehouse, which was completed November 10, 1928; addition of gymnasium and assembly hall to the Wheatley School, which was completed January 3, 1929; 6-room addition to the Bryan School, which was completed March 26, 1929; E. A. Paul Junior High School, which will be completed December 1, 1929; John Quincy Adams School, 24-room building, including combination gymnasium and assembly hall, which will be completed December 1, 1929; Langdon School, 16-room building, including combination gymnasium and assembly hall, which will be completed about December 16, 1929; 4-room addition to S. J. Bowen School, which will be completed September 22, 1929; 10-room addition to Francis Junior High School, including gymnasium and lunch room, which will be completed September 9, 1929; 8-room addition to the Raymond School, including gymnasium and assembly hall, which will be completed October 23, 1929; addition of gymnasium and assembly hall to Takoma School, which will be completed about September 15, 1929; 8-room addition to the Morgan School, including a combination gymnasium and assembly hall, which will be completed December 26, 1929; Ben W. Murch School, 8-room extensible building, including combination gymnasium and assembly hall, which will be completed December 15, 1929; Burrville School, 8-room addition, including gymnasium and assembly hall, which will be completed October 19, 1929.

In addition to the preparation of plans and specifications for the above-mentioned buildings, plans and specifications for about 40 other items of work, such as alterations and repairs to buildings, heating installations, plumbing, and electrical work for the various buildings, have been prepared in this office, the contract prices therefor amounting to \$292,480.95.

The contracts entered into by this office during the fiscal year beginning July 1, 1928, and ending June 30, 1929, amounted to \$2,785,822.32.

REPAIRS TO MUNICIPAL BUILDINGS

All municipal buildings are kept in repair under the direction of the municipal architect.

The appropriations for repair work and the expenditures of some were as follows:

For the repairs and improvements to school buildings and grounds, \$529,610 was appropriated. All of this amount was expended during the year.

For repairs and improvements to buildings and grounds of the fire department, \$25,000 was appropriated. All of this amount was expended except \$3.33.

For repairs and improvements to police stations and station grounds, \$9,500 was appropriated. All of this amount was expended except \$191.52.

For repairs and alterations to police-court building, \$2,500 was appropriated. All of this amount was expended except \$73.37.

In addition to the above, repairs were made on various buildings to the amount of \$234,802.07 out of the appropriations controlled by other departments. Of this amount, \$99,939.43 was expended for improvements of public-school grounds.

WORKHOUSE AND REFORMATORY

The principal work done at the workhouse was the starting of the foundation of mess hall in building No. 1; completion of cells and interior work in building No. 2, made ready for occupancy; completion of roof on building No. 9 and building equipped with facilities for bathing inmates and for the storage, repair, and laundering of clothing; carried brickwork sill high in rear section of building No. 10; construction of building No. 11 and building equipped for use as a recreation hall temporarily.

The following permanent buildings at the workhouse were completed and in service on June 30: 6 dormitories, and 1 disciplinary dormitory with 38 cells and office for disciplinary officer. One dormitory and one mess hall are under construction.

The work done on the railroad consisted of a complete overhauling of the 45-ton steam locomotive by the Newport News Shipbuilding & Dry Dock Co. and the completion, in part, of a new spur on the track to the boiler house at the reformatory.

The principal work done at the brick plant consisted of the construction of two new kilns with stacks and construction of two new kilns on foundations of old kilns, using stacks and ducts of old kilns. One hundred new dryer cars were obtained, together with a number of flat cars and other equipment for handling bricks. A complete new pyrometer system was installed for indicating and recording the temperature of various brick kilns. Specifications were prepared and contract let for the installation of an electric vibrating screen for screening clay.

A new timber wharf, approximately 220 feet long, was constructed near Ninth and Water Streets SW., under supervision of the District of Columbia bridge department for the penal institutions. Treated southern pine timber was purchased for construction of four barges, two of which were completed and the third was under construction during June. One house boat was constructed for handling general supplies.

Preliminary studies were made for the establishment of a combined heating and electric power plant at the workhouse.

The principal work done at the reformatory was the completion of brickwork and roof on dormitories No. 4, No. 5, and No. 6, except part of roof on dormitory No. 4; completion of roofs, installation of interior equipment, and painting of dormitories No. 7, No. 8, and No. 9; painting of dormitories No. 10 and No. 11 and completion of interior equipment for occupancy; installation of shower baths, water heater, and other interior equipment in bath house No. 16; foundations placed and brickwork carried sill high on buildings No. 24 and No. 25; completion of building No. 26, except for interior equipment and painting.

The following permanent buildings at the reformatory were completed and in service on June 30: Nine dormitories, 2 disciplinary dormitories, 5 shops, 1 mess hall, 1 bathhouse, and 1 boiler house. Three dormitories, 1 assembly hall, 2 disciplinary dormitories, and 1 office and disciplinary building are under construction.

An athletic field with permanent seats was developed by filling in a ravine on north sides of buildings.

A new steel water-storage tank of 100,000 gallons capacity was constructed at the District of Columbia Reformatory under contract with the Youngstown Boiler & Tank Co. in the sum of \$8,180. Work was started May 6, 1929, and completed June 18, 1929.

Some studies were made and preliminary estimates were prepared for other improvements to the water supply.

HARBOR FRONT

Washington is at the head of navigation of the Potomac River, about 185 miles from the Atlantic Ocean. The total available water front is about 18 miles, of which about 8 miles has been set aside by the Federal Government for its own use and for park purposes. The greater part of the wharf property under the control of the commissioners is located along the Washington Channel.

The harbor police station and dock, the dock of the fireboat, the District morgue, the municipal fish wharves and market, and the District workhouse wharf are located on the Washington Channel between N Street south and Thirteenth Street west. The balance of this frontage is leased by steamboat companies, boathouses, warehouses, lumber dealers, etc.

The total income from wharf rentals, including the fish market, amounted to \$39,297.40, an increase of \$2,991.51 over the income for the last fiscal year.

The use of the District sand wharf for the receipt of sand and gravel has been discontinued and all material stored thereon was removed. Recommendation has been made that this wharf be transferred to the workhouse authorities in order to afford increased storage facilities for brick and other Occoquan products.

The wharf committee renews its recommendation that early action be taken for the development and improvement of the water front along the north side of the Washington Channel between Fourteenth Street west and P Street south.

DISTRICT BUILDING

The care and maintenance of the District Building embraced the power plant, woodwork and paint shop, electrical shop, blue print and photograph shop, the watch force, cleaning and laboring forces, and the elevator force.

There were purchased and installed 36 door interlocks, 1 at each landing of each passenger elevator. Two hand-drying machines were purchased and installed in two lavatories; as the result of their use the saving in paper towels has more than paid for the dryers. The roof of the District Building is in need of repair.

There were consumed 2,323 tons of coal, purchased at an average cost of \$5.29126 per ton, which ranged from 10.4 to 16 per cent ash. There were 535 $\frac{1}{3}$ cubic yards of ashes removed at \$0.34 per cubic yard. Numerous repairs were made to boilers, furnaces, and to the refrigerating, heating, and ventilating systems. One new pump was purchased and installed for use in conjunction with the water-cooling system. The total number of kilowatt-hours generated was 778,565. Of this there were used for lighting 605,370, for elevators 50,580,

and for miscellaneous motors 122,615 kilowatt-hours. The pneumatic-tube system was in operation 3,522 hours, the heating system 5,124 hours, and the ventilating system 1,249 hours.

Repairs and replacements were made throughout the building by the woodwork and paint shop and by the electrical shop. There were 205,881 square feet of blue printing completed at a cost of \$5,184.06, and photographs, photostats, and maps totaling \$369.88.

STREET LIGHTING

There are 27,513 public lamps of all kinds in the avenues, streets, alleys, etc., under the jurisdiction of the Commissioners of the District of Columbia. Of these 8,958 are gas and 18,555 electric; of the gas lamps, 8,412 are single-burner mantle, 60 candlepower; 358 are double-burner mantle, 120 candlepower; and 188 are small flat flame, 8 candlepower, for designation purposes; of the electric, 1,425 are magnetite arc, 16,676 are incandescent, ranging from 60 to 1,000 candlepower each (32 per cent of 60 and 100), and 454 are incandescent of about 10 candlepower for "designation."

There was a net increase during the year of 1,165 lamps.

The increase in aggregate candlepower of the street-lighting system under the jurisdiction of the commissioners is from approximately 6,037,000 to approximately 6,865,000, about 13¾ per cent. The increase in annual charges is, however, only about 8⅔ per cent. The cost rate, in annual rate charges, on the total installation was reduced from 11.97 cents to 11.44 cents per candlepower year.

The total gas lighting has been reduced by more than 11½ per cent and from about 15½ per cent to less than 8 per cent of the total candlepower.

The approved project of improved lighting has been further advanced, with continued but less exclusive attention to highways and full attention to anticipation of paving. There has been some comprehensive treatment of areas, as distinguished from through lines of thoroughfare.

Of 6.6 ampere lamps (rating 1,120 candlepower and 7.17 cents per candlepower year), the number in service was increased by 150 to 1,386; of 4-ampere arc lamps (rating 430 candlepower and 14.75 cents per candlepower year) the number in service was decreased by 17 to 39. The improved arc lamp retains a place in "planned lighting," not only by reason of its high economy but because its color characteristic is valuable in contrast with that of lighted show windows. Example of recent arc-lamp installation is Ninth Street from Pennsylvania Avenue to U Street NW.

Of incandescent lamps of 1,000 candlepower, 600 candlepower, 400 candlepower, and 250 candlepower combined, the number in service was increased by 2,672; of 100 candlepower and 60 candlepower, decreased by 646; net increase, 2,026. Among the prominent items of new incandescent lighting are: (a) R Street, Sixth Street to Massachusetts Avenue, NW.; (b) Virginia Avenue, Second to Eleventh Streets SE., and from B to Twenty-sixth Street NW.; (c) Minnesota Avenue, Pennsylvania Avenue to Eighteenth Street SE.; (d) Conduit Road, Foxall Road to District line NW.

Of the mantle gas lamps, the number of single-burner in service was decreased by 790 and of double-burner decreased by 199; the decrease in mantles was 11.52 per cent, compared with 11.02 per cent and 8.26 per cent in the next two preceding years and compared with increases in earlier years.

Of the designation lamps in service, there was a net increase of 64 electric, a decrease of 69 gas; net overall decrease of 5. These lamps are used mostly to maintain a red light on post bearing a fire-alarm box.

The maintenance and operation (not the installation) of traffic signal lights was transferred to the street-lighting appropriation. The overall installation was increased during the year by 523, from 200 to 723 lights; the installation at the end of the fiscal year consists of 560 single-face, one-way, 60-watt fixtures, with amber overlap on basis of 50-second cycles with 10 second overlapping in each cycle, and an aggregate of 163 of 6 variants.

SIGNALS SYSTEM—FIRE ALARM, POLICE PATROL, AND TELEPHONE SERVICES

There were 943 fire-alarm boxes in service at the end of the year—813 on underground and 130 on overhead wires—a net increase of 1 over the preceding year; 4 boxes were changed from overhead to underground connection; 4,185 box and local fire alarms (exclusive of "additional" alarms) were received and transmitted during the year, of which 301 were false alarms.

There were 533 police-patrol boxes in service at the end of the year—438 on underground and 95 on overhead wires—an increase of 3 over the preceding year; 2 boxes were changed from overhead to underground connection.

There were 1,881 telephones connected to the District system at the end of the year and 29 in use as portable sets by fire and electrical departments, an increase of 61 in the year.

There was no change in the number of cells of storage battery in service on fire alarm, police patrol, and local circuits—2,692.

There were, of the distribution equipment of the composite signals system (fire alarm, police patrol, and telephone), at the end of the year, a grand total of 8,852 miles of conductor, of which 8,670 are underground and 182 miles overhead, an increase of 125 miles underground.

REGULATION OF ELECTRIC WIRING

The number of permits issued for installation of electrical wires and apparatus on private premises was 14,947; fees paid to collector of taxes, \$30,614.

There are of record in streets, avenues, alleys, etc., of the District of Columbia, in the service of the United States, the District of Columbia, and public-service companies, wire-carrying poles to the number of 29,273, of which 761 are Government owned.

SEWERAGE AND SEWAGE DISPOSAL SYSTEM

The construction and maintenance of the sewerage and sewage disposal system of the District of Columbia is placed under a department in charge of the sanitary engineer.

The length of main and pipe sewers constructed during the year was 26.45 miles. The total length of main and pipe sewers on June 30, 1929, was 923.53 miles, of which 181.17 were main sewers and 742.36 miles were pipe sewers. In addition to the sewers constructed during the year, 766 storm-water catch basins were constructed, bringing the total now in use to 8,271.

There was expended during the year on new extensions of the sewerage system the sum of \$1,141,403.54 and on the sewage disposal system \$58,848.14. The total cost of the sewerage system to June 30, 1929, was \$21,455,232.35 and of the sewage-disposal system to the same date was \$6,340,416.64, a total cost of \$27,795,648.99.

The main sewerage pumping station and three substations were in continuous operation throughout the year. The pumpage of sewage and storm water at the main station amounted to 30,211,645,000 gallons during the year. The Poplar Point substation pumped 1,318,403,348 gallons, the Rock Creek substation 1,341,848,000 gallons, and the Earle Place substation 487,878 gallons. Eliminating Rock Creek and Earle Place substations, which deliver their discharge to the main station, the above indicates a mean daily discharge through the outfall sewer of 86,383,694 gallons, a considerable increase over the previous year.

The coal consumption fell to 4,256 tons, 167 tons less than the previous year, although the total mechanical work performed was approximately 1.5 per cent greater.

The pollution of the Potomac River through the discharge of raw sewage was approximately the same as for the preceding year, but not as bad as it has been during some recent years.

New pumps, motors, and starting equipment were installed during the year in Rock Creek substation, increasing the pumping capacity about fivefold. This equipment is automatic and has enabled the department to release two of the station attendants and to do away with the hauling of screenings.

During the latter part of the year a contract was let for the purchase of new motors, pumps, and starting equipment for Poplar Point substation. This action was necessitated by the increasing burden on this station and by the deterioration of the present equipment.

The storm of June 21-22 was unusual in character, inasmuch as the rate of precipitation for periods ranging from 15 minutes to 60 minutes exceeded the maximum rates of all storms of record during the previous 32 years, causing more complaints to be received than for any previous storm of record. While the records of the United States Weather Bureau indicated a maximum rate of precipitation of but 4.44, 3.02, and 1.81 for 15, 30, and 60 minute periods, respectively, gages of the sewer department located in other sections of the city indicated maximum rates of precipitation during these same periods of 6.63, 5.31, and 3.58 inches per hour.

Through research and cooperation with the United States Bureau of Standards and the interested public, the economical rerefining of used crank-case oil has been commercially effected, thereby offering the best positive relief from the menace of having such oils deposited in the public sewers, which has been found to be a menace to life and property.

WATER MAINS

During the year 116,122 linear feet of water main of various sizes were laid, being about 1.35 miles more than the preceding year, at an aggregated cost of \$540,563.48. The total length of water mains of all sizes is 794.15 miles.

WATER CONSUMPTION

The mean daily water consumption was 73,567,771 gallons, an approximate mean daily per capita consumption of 133 gallons. The District of Columbia pumping station on Bryant Street was called upon four times during the year to assist the new station at Dalecarlia.

WATER METERS

During the year 967 meters were installed, and 79,846, or 84.6 per cent, of the total water services are now metered.

PROCTOR L. DOUGHERTY,

SIDNEY F. TALIAFERRO,

WILLIAM B. LADUE,

Commissioners of the District of Columbia.

REPORT OF THE BOARD FOR THE CONDEMNATION OF INSANITARY BUILDINGS

SEPTEMBER 1, 1929.

GENTLEMEN: We have the honor to submit the following report for the year ended June 30, 1929, buildings on which action was taken in response to notices served under the act creating the Board for the Condemnation of Insanitary Buildings during the year ended June 30, 1929.

Report for year ended June 30, 1929

	Examined	Razed	Repaired	Pending	No action taken	Future action of board	Estimated value of repairs
Buildings in streets.....	545	112	212	45	118	58	\$69,330
Buildings in alleys.....	282	24	51	25	67	115	2,000
Total.....	827	136	263	70	185	173	71,330

Buildings acted upon since creation of board to June 30, 1929

Buildings in streets:

Examined	6,909
Razed.....	2,629
Repaired	2,909
No action taken.....	1,162
Pending.....	45
Examined, held for future action.....	58
Value of repairs.....	\$625,398

Buildings in alleys:

Examined	6,187
Razed.....	1,231
Repaired	7,773
No action taken.....	3,377
Pending.....	25
Examined, held for future action.....	115
Value of repairs.....	\$82,805

Number of buildings taken down by board during year ended June 30, 1929.....	136
Number of board meetings held during the year ended June 30, 1929..	6
Number of condemnation orders served during year ended June 30, 1929..	251
Number of visits made in connection with the examination, service orders, repairs being made to buildings, the demolishing and removal of condemned buildings.....	2,342
Number of boards of survey appointed to review condemned buildings...	6
Estimated number of people required to secure other living quarters through action of the board during the year ended June 30, 1929....	816
Estimated number of occupants of buildings benefited by repairs to buildings during the year ended June 30, 1929.....	1,180
Estimated value of repairs made to buildings during the year ended June 30, 1929.....	\$71,330

Owing to recent decisions of the courts in several condemnation cases, the District government was required to pay for old dilapidated and insanitary buildings under the terms of section 14 of the act of Congress creating the Board for the Condemnation of Insanitary

Buildings, which section grants the property owner the right of appeal from the condemnation orders of the board.

In our report of September 1, 1928, we recommended that this section of the act of Congress be modified or amended. In pursuance with the foregoing recommendation, a bill has been carefully prepared by this board, with the assistance and advice of the corporation counsel, revising the entire act of Congress creating the Board for the Condemnation of Insanitary Buildings and combining the same with the act of Congress giving the Commissioners of the District of Columbia authority to condemn dangerous and unsafe buildings and cause their removal within the District of Columbia.

The above-mentioned bill is now in the office of the corporation counsel, and we urgently recommend that every effort possible be made to have the same enacted into law at the coming session of Congress.

The enactment of this proposed new law will enable the board to secure the removal or repair of dangerous, unsafe, and insanitary buildings in a more expeditious manner. The rights of both the District government and the property owners have been carefully considered in preparing the proposed new law, and we believe the same to be fair and just to both parties and will meet the District government requirements for many years to come.

We wish to invite your attention to the fact that there are approximately 10,000 people living in dwelling houses situated along the alleys throughout the District of Columbia. It is our opinion that legislation should be enacted at an early date to prohibit the use of alleys as highways on which to maintain buildings for dwelling or residential use, unless the same be at least 30 feet wide and extend straight through the square from street to street, and each building so maintained for living purposes must be provided with water, lights, and plumbing as required for new dwelling and apartment buildings.

D. A. DAVISON,
Major, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner,
W. C. FOWLER, M. D.,
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of the District of Columbia.

To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA
(through the engineer commissioner).

REPORT OF THE WHARF COMMITTEE

SEPTEMBER 16, 1929.

GENTLEMEN: The wharf committee has the honor to submit the following report for the fiscal year ended June 30, 1929:

The Commissioners of the District of Columbia have exclusive charge and control over the water frontage along the Washington

Channel of the Potomac River between N and Thirteenth Streets SW. for an approximate length of 3,700 linear feet. This water frontage is used and occupied by the municipal fish market and wharves, the headquarters of the fire boat company, the morgue, the harbor precinct, and the workhouse and sand wharves, all of which are municipal activities, and also by lumber and cordwood dealers, warehousemen, boathouses, marine railways, and four steamboat companies operating passenger and freight steamers.

The water front along the Georgetown Channel is in private ownership, with the exception of the termini of public streets.

Along the Anacostia River the United States Navy Yard occupies the frontage on the west bank between Second and Eleventh Streets SE. The sewerage pumping station and yard occupies the frontage between First and Second Streets. The intake of the Capitol power plant is located at the foot of First Street SE. The only frontage along the Anacostia River under lease is that between the building lines of Q and R Streets SE.

Leases of the following tenants expired during the year:

George W. Muller, foot of N Street SW.

James O. Holmes, foot of Eighth Street SW.

Johnson & Wimsatt, foot of Ninth Street SW.

Capital Yacht Club, foot of Ninth Street SW.

Wilson & Raleigh, foot of Ninth Street SW.

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I. S. Turover, foot of Thirteenth Street SW.

William A. Ragan, foot of Thirteenth Street SW.

Smoot Sand & Gravel Co., foot of Q Street SE.

Columbia Sand & Gravel Co., foot of R Street SE.

All of these leases, with the exception of George W. Muller and William A. Ragan, were renewed. The leases of the Capital Yacht Club, Johnson & Wimsatt, L. A. Clarke & Son, and I. S. Turover provided for increased rentals, the total increase amounting to over \$1,000 a year.

New leases were entered into with Arthur Seagren for the water space formerly leased by George W. Muller and with Ragan & Dean for the wharf property formerly leased by William A. Ragan.

The wharf property formerly leased by Johnson & Wimsatt, at the foot of Thirteenth Street SW., was assigned to the police department for the storage of automobiles recovered by that department. This property has been inclosed by a wooden fence.

The total revenues derived from wharf rentals, including the municipal fish market, amounted to \$39,297.40, an increase of \$2,991.51 over the revenues for the last fiscal year and of \$4,738.95 over the revenues of the preceding fiscal year. Excluding the receipts from the municipal fish market, the revenues derived amounted to approximately \$22,000—\$6,000 more than was received 10 years ago, when real estate rentals were generally much higher. This increase is notable in that one of the large revenue-producing wharves has been assigned to the police department and because it has been possible to show an increase in wharf revenues notwithstanding 10 years' depreciation of leased water-front structures on which there have been no public expenditures.

A statement showing leaseholds is on file in this office.

WATER MAINS

During the year 116,122 linear feet of water main of various sizes were laid, being about 1.35 miles more than the preceding year, at an aggregated cost of \$540,563.48. The total length of water mains of all sizes is 794.15 miles.

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To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA
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SEPTEMBER 16, 1929.

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A statement showing leaseholds is on file in this office.

During the year the morgue wharf was reconstructed at a cost of \$6,000, the work being done by contract under a special appropriation made by Congress.

Three fender piles were driven at wharf No. 6, a small amount of timber curb replaced, and defective concrete footings repaired at a cost of \$2,467.84.

An allotment of \$4,453 was made from the appropriation for reconditioning barges and repairing wharves at Occoquan and Washington and for the reconstruction of the workhouse wharf at the foot of Ninth Street. This work was completed at a cost of \$4,275.23. Prison labor was employed on this work, except for the driving of piles, which was done by contract with George T. Johnson, of Cambridge, Md.

The fire-boat wharf is in a defective condition and should be reconstructed.

A plan for the development of the west shore of the Anacostia River between Buzzards Point and the navy yard for the city's future industrial expansion is under consideration by the National Capital Park and Planning Commission. This plan provides for a quay, rail connections, and warehouse facilities.

The wharf committee renews its recommendation that early action be taken for the development and improvement of the water front along the north side of the Washington Channel between Fourteenth Street west and P Street south. A plan for this improvement and a report thereon was submitted to the Chief of Engineers by the local United States Engineer's office in 1926, but no action has yet been taken. It is hoped that the incoming Chief of Engineers will recommend that the report be transmitted to Congress for favorable action and that during the next regular session funds for beginning this noteworthy project at an early date will be appropriated.

The use of the District sand wharf for the receipt of sand and gravel has been discontinued and all material stored thereon removed. The timber portion of this wharf, containing an area of 8,340 square feet, is in a very defective condition and can not be used without complete rebuilding or substantial repairs. To reconstruct the timber portion of the wharf would cost approximately \$11,500. This estimate may be reduced if prison labor is employed. The wharf committee recommends that the sand wharf be transferred to the workhouse authorities in order to afford increased storage facilities for brick and other Occoquan products. The additional area would also provide ample space for the construction of a new building to provide suitable housing accommodations for the prisoners at the workhouse wharf in Washington. The removal of the fence in front of the workhouse and sand wharves to the building line should precede any new construction of this character.

The Washington Motor Boat Co. has taken over the old clubhouse of the Capital Yacht Club, under authority of a sublease, as headquarters for the sale and servicing of speed boats. This form of water sport is appealing to many Washingtonians and is believed to be a wholesome and thoroughly enjoyable form of recreation. However, some complaints have been received from tenants and others that these speed boats cause a heavy wash and are damaging craft lying at anchor. The owners of these speed boats have been

cautioned to reduce the speed in the harbor and they have agreed to cooperate with the municipal authorities.

The Potomac Freight Terminal Co. has about completed the construction of 32 stores along the north side of Water Street SW., between Twelfth and Fourteenth Streets to be used as a wholesale market center for agricultural products. Also, one of the local banks has opened a branch bank in a new building on Water Street opposite the fish market. This would seem to indicate that the area along the Washington Channel between the fish market and the railroad embankment will become increasingly important and valuable and may create a demand for a more appropriate use of this part of the water front than now obtains.

Heretofore there has been no annual maintenance fund for the repair and upkeep of wharves devoted to municipal activities. These wharves have a valuation of approximately \$170,000, and a small maintenance appropriation of \$10,000 a year, which is about 6 per cent of the valuation of these structures, is essential for proper and efficient maintenance.

In 1928 the commissioners directed the wharf committee to negotiate with the Washington & Old Dominion Railway Co. and the Arlington & Fairfax Railway Co. for the leasing of the public space on the Virginia approach to the Key Bridge. Both of these railway companies have maintained terminals, trackage, and unloading platforms on this reservation under authority of short-term leases. The lease of the Washington & Old Dominion Railway Co. expired on February 28, 1929, and has not been renewed. Steps have been taken to procure the execution of a new lease at an increased rental or vacation of the property. Negotiations are now pending with the Arlington & Fairfax Railway Co. for the renewal of its lease at an increased rental. This company has vacated the area known as parcel B and has removed the old freight station.

The wharf committee notes with considerable interest that legislation is pending before Congress looking to the removal of the old Aqueduct Bridge and the improvement of the Virginia approach to the Key Bridge. The wharf committee believes that the approaches to the new Key Bridge, which includes the unimproved property owned by the Government immediately east of the Georgetown end of the bridge, should be improved and beautified in an attractive manner in keeping with the dignity of the concrete structure which spans the Potomac between Rosslyn, Va., and Georgetown, D. C.

Very respectfully,

ROLAND M. BRENNAN,
C. R. WHYTE,
E. T. HARNEY,
Wharf Committee.

To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA
(through the engineer commissioner).

SEPTEMBER 1, 1929.

SIR: I have the honor to submit herewith the annual reports of the inspector of buildings, the inspector of plumbing, the inspector of steam boilers, the plumbing board, city refuse and street-cleaning

divisions, and the electrical department for the fiscal year ended June 30, 1929.

Respectfully,

DONALD A. DAVISON,
Major, Corps of Engineers, United States Army,
Assistant.

To the ENGINEER COMMISSIONER.

REPORT OF THE INSPECTOR OF BUILDINGS

AUGUST 26, 1929.

SIR: I submit herewith the annual report of the building-inspection division for the fiscal year ended June 30, 1929.

The report includes no record of building operations conducted by the Federal Government or by the District of Columbia government.

Statement of permits issued from July 1, 1928 to June 30, 1929

	Number	Value		Number	Value
Brick:			Stone:		
Dwellings.....	1, 113	\$8, 990, 275	Dwellings.....	32	\$822, 200
Apartments.....	70	16, 696, 000	Garages.....	5	22, 000
Garages.....	260	154, 555	Auditorium.....	1	1, 290, 000
Stores.....	145	1, 700, 850	Repairs.....	27	30, 535
Offices.....	7	4, 898, 600	Concrete:		
Public garages.....	10	497, 700	Dwellings.....	15	86, 850
Gas stations.....	30	244, 000	Garages.....	105	42, 635
Warehouses.....	7	132, 200	Gas stations.....	3	10, 000
Churches.....	6	424, 000	Warehouses.....	2	125, 000
Bank.....	1	20, 000	Stores.....	4	30, 200
Embassies.....	2	210, 000	Greenhouse.....	1	3, 000
Schools.....	6	1, 706, 000	Repairs.....	72	173, 340
Laundry.....	1	100, 000	Frame:		
Field house.....	1	45, 000	Dwellings.....	257	1, 259, 825
Market.....	1	75, 000	Garages.....	243	55, 460
Laboratory.....	1	30, 000	Gymnasium.....	1	20, 000
Substations.....	2	169, 000	Churches.....	2	12, 500
Sheds.....	9	15, 000	Sheds.....	55	10, 265
Theaters.....	1	20, 000	Repairs.....	555	231, 030
Studios.....	1	5, 000	Metal:		
Hotels.....	2	2, 650, 000	Garages.....	840	133, 745
Stable.....	1	800	Sheds.....	15	15, 810
Shops.....	4	40, 500	Repairs.....	3	2, 650
Gymnasium.....	1	10, 000	Machinery:		
Hospitals.....	2	355, 000	Motors.....	1, 780	285, 490
Undertaker's parlor.....	1	12, 500	Elevators.....	189	806, 705
Dairy.....	1	35, 000	Bollers.....	91	57, 780
Factory.....	1	50, 000	Steel tanks.....	3	22, 500
Industrial home.....	1	100, 000			
Dormitory.....	1	236, 000	Total.....	7, 755	47, 743, 915
Repairs.....	1, 728	2, 583, 115			
Tile:					
Dwellings.....	6	53, 150			
Garages.....	16	5, 700			
Repairs.....	15	19, 450			

Distribution of improvements in sections

	Buildings	Repairs, etc.
Northeast.....		
Southwest.....	\$4, 980, 315	\$492, 520
Northwest.....	931, 840	178, 655
Southwest.....	37, 079, 135	3, 580, 215
	424, 750	76, 485
Total.....		
Repairs, etc.....	43, 416, 040	4, 327, 875
	4, 327, 875	
Grand total.....	47, 743, 915	

Comparative statement for years 1928 and 1929

	Repairs, etc.	New build- ings	Dwellings	Apart- ments	Business buildings
1929.....	6,015	1,740	1,423	70	247
1928.....	5,019	2,178	1,539	59	580
Increase.....	996	1,438	116	11	1,333

¹ Decrease.*Estimated number of buildings in the District of Columbia¹*

	Brick	Stone	Concrete	Tile	Frame
1929, erected.....	1,692	53	115	22	260
1929, razed.....	242				223
Total.....	1,450	53	115	22	37
Add total as of 1928.....	87,443	185	1,025	693	31,272
Grand total.....	88,893	238	1,140	715	31,309

¹ This estimate is necessarily broad, data for an accurate estimate not being available.*Comparative statement for past six years*

Year	Repairs, etc.	New buildings	Dwell- ings	Apart- ments	Business buildings	Number of permits	Value
1924.....	5,356	3,012	2,079	81	852	11,446	\$39,403,207
1925.....	5,584	5,319	4,129	120	1,078	11,993	62,862,980
1926.....	5,520	5,066	4,135	173	758	11,574	63,599,280
1927.....	4,926	3,285	2,477	109	699	10,798	49,776,865
1928.....	5,019	2,178	1,539	59	580	9,802	37,736,170
1929.....	6,015	1,740	1,423	70	237	9,620	47,743,195

From the foregoing figures it can be seen that building activities in the District of Columbia for the fiscal year 1929 showed an increase of \$10,007,025 as compared with the previous year, and a decrease of but \$2,033,670 as compared with the fiscal year of 1927, which was considered an abnormal one.

The increase may be attributed in a large measure to the numerous large projects, permits for which were issued during this period, and to the resumption on a smaller scale of speculative building.

While the value of building operations showed an increase, the number of permits issued during this period were less in number by 182 as compared with the previous year, 9,620 having been issued during the fiscal year 1929.

HOUSING ACCOMMODATIONS

There were issued during this fiscal year permits for 1,225 one-family houses, a decrease of 17 compared with the figure of last year; 11 two-family houses, an increase of 2; and 3 three-family houses, an increase of 2. Permits for 70 apartments (an increase of 11) disclose that they were built to accommodate 2,476 families.

SIGNS

During the fiscal year permits for 1,629 signs were issued (a decrease of 22 compared with 1928), 1,295 of which were 50 square feet or under, 309 were 51 to 100 square feet, and 25 exceeded the maximum limit of 100 square feet as allowed under the provisions of the sign regulations, for which approval of the commissioners was necessary prior to the issuance of permits. The materials of which these signs were made consisted of wood, metal, canvas, and many combinations of wood and metal, as well as being painted on the wall. There were 1,517 the materials of which consisted of wood, metal, or paint; 66 signs of canvas and 20 roof signs. Among the 40 signs having miscellaneous material, the greater majority consisted of glass (barber poles) and metal and glass.

The decrease in the number of signs issued is due in no little measure to the fact that this office makes inspection of each premises upon which application is made to erect a sign for the purpose of determining whether the sign applied for will cause an excess of 100 square feet of sign space on the building. Numerous applications for additional sign area have been disapproved because of this practice.

It is desired at the present time to call the attention of the commissioners to the fact that this office is preparing an amendment to the act of Congress, together with a revised draft of new sign regulations.

ELEVATOR BUREAU

During the past fiscal year 2,993 triyearly inspections were made by the inspectors of this section, an increase of 304 inspections as compared with the last fiscal year. Permits were issued for 189 elevators during the past year; of this number, 120 were approved for operation, an increase of 3, as compared with the previous year. Segregating the number of approved installations, we find that 88 were of the passenger type and 32 of the freight.

Checks totaling \$3,508.75 were received, paying for 2,807 inspections (an increase of \$382.50 and 306, respectively), the cost of inspection being \$1.25 per elevator. During the fiscal year, 973 licenses for the operation of elevators were issued, a decrease of 78 as compared with the previous year.

Of particular note is the fact that this bureau inspects the elevators in Government buildings, there being 38 buildings housing 117 elevators. While this office is without authority to enforce its recommendations and suggestions relative to elevators in Government buildings, we have at all times received the utmost cooperation.

Unfortunately 21 accidents occurred on elevators during the past fiscal year. But four of these accidents proved fatal, 12 persons having been injured. Examination and investigation showed that in but five instances were the accidents due to faulty mechanism.

This department has prepared a draft of a new elevator code in view of the present one having been held ineffective in a recent police court decision. This code was referred to the corporation counsel for an opinion as to the legality of the administrative section, the technical sections at the present being under review by a committee composed of the chief elevator inspector, an elevator inspector, a representative of the Bureau of Standards, one from the Elevator Constructors' Union, and two from elevator construction companies.

OCCUPANCY PERMITS

During the fiscal year 1929 there were issued 5,669 certificates of occupancy permitting the use of a building for commercial purposes as provided under the zoning regulations, an increase of 2,490 as compared with the figure of last year of 3,179. These certificates were a source of revenue in the amount of \$5,384.

Of the total number issued, 80 were for a residential use in a residential zone, 421 for a first commercial use in a residential zone, 4,185 for a first commercial use in a first commercial zone, 554 for a first commercial use in a second commercial district, 19 for a first commercial use in an industrial zone, 41 for a second commercial use in a residential zone, 40 for a second commercial use in a first commercial zone, 242 for a second commercial use in a second commercial zone, 23 for a second commercial use in an industrial zone, 2 for an industrial use in a residential zone, 1 for an industrial use in a first commercial zone, 2 for an industrial use in a second commercial zone, 52 for an industrial use in an industrial zone, and 7 miscellaneous uses in Government-owned properties.

The increase shown is attributed in a large measure to the efforts and cooperation of the police department in their drive on business establishments to procure the necessary certificates of occupancy.

FIELD INSPECTORS, REINFORCED CONCRETE INSPECTORS, AND STEEL INSPECTORS

During the fiscal year of which this report has reference there were 45,666 inspections made by all the inspectors of this bureau (an increase of 2,660, compared with the figures of 1928), 37,344 of which were made by the field inspectors and 8,322 of which were made by the reinforced concrete and steel inspectors.

FIRE ESCAPES, FIRE EQUIPMENT, AND ENTERTAINMENT

During the past fiscal year 183 inspections were made of public hall, theaters, and hotels (an increase of 9), fees in the sum of \$770 being collected. Inspections for 1-night entertainments numbered 28, \$28 being paid in fees, an increase of 12.

The checking of plans relative to fire equipment for new buildings numbered 66, \$660 being collected in fees. Plans checked as to the layout of electrical fixtures and lights numbered approximately 200, no fee being charged for this service.

There were 2,440 inspections made of new and old apartments and buildings as to the necessity of providing fire equipment to comply with the fire escape law, the source of complaint originating in most instances with the fire department. Following these inspections, 186 commissioners' notices were prepared and forwarded for approval by the commissioners and served upon the owner or agent. Approximately 700 letters dealing with phases within the jurisdiction of this bureau were prepared and mailed. The total number of inspections of this bureau and the fees collected were 2,651 and \$1,458, respectively.

COMPLAINT DEPARTMENT

A total of 935 complaints were received in this department during the past fiscal year, the source coming from the police, health, plumbing, fire, and electrical departments, as well as by mail, telephone, and personal appearance. In addition, numerous instances of defective conditions of buildings were discovered by the inspectors in the field. The majority of the complaints pertained to dilapidated sheds, steps, porches, floors, walls, and falling plaster. There were 612 notices written and served upon the owner or agent to correct the condition complained of and any other danger or violation found upon investigation. Of this number, 244 conditions were corrected. In addition, it was necessary to write 742 follow-up notices before compliance was effected. There were 1,209 miscellaneous inspections of buildings by this bureau, notices for which were not necessary.

It is difficult to appreciate the vast amount of work done by this bureau and the service rendered to the public. Each complaint must be carefully investigated, some of which are merely the result of neighborly quarrels, and notices prepared where conditions warrant advising the owner or agent of the necessity of repairing or removing a certain danger or nuisance. After the allotted time in which to effect compliance with the notice served, another inspection must be made to ascertain whether the conditions have been remedied, and if so, to what extent. In many cases a second and sometimes a third notice as well as the resultant follow-ups are necessary before a dangerous condition will be remedied. In but few instances is it necessary to resort to court action.

FEES COLLECTED, ALLOTMENTS, AND EXPENDITURES

The building inspection division caused to be paid into the United States Treasury, through the collector of taxes, during the fiscal year just ended the sum of \$65,627.50 in fees for permits, licenses, etc., an increase of \$3,859.75 compared with the previous year.

The amount expended for salaries was \$120,171.68, the expenditure for contingent and miscellaneous expenses was \$2,073.14, and the amount for postage, \$270. The expenditure for motor vehicles was \$2,574, a total expenditure, as can be seen from the foregoing figures, of \$125,088.82.

It is proposed to revise the schedule of fees for permits, inspections, etc., in order to permit this department to operate upon as near a self-sustaining basis as possible, this revision to be incorporated in the revised building code to be published soon.

PLAN EXAMINERS

Among the larger projects for which plans were submitted and approval given by this division for the issuance of permits during the fiscal year 1929, were three 11-story office buildings, an 8-story office building, a 12-story hotel, an 8-story hotel, an 8-story hospital, the D. A. R. Auditorium, an 11-story apartment, nine 8-story apartments, eighteen 5-story apartments, two 4-story apartments, four churches, a 4-story hospital, four 3-story schools, two 4-story schools, and five industrial buildings (laundry, garage, printing plant, etc.).

Of the larger projects on file as of July 1, awaiting approval and the issuance of permits, were a 3-story baking plant, a 9-story store, two 8-story apartments, a 5-story apartment, a 3-story apartment, a 4-story clubhouse, two 6-story office buildings, a church, a 5-story storage plant, and a 4-story printing plant.

SPECIAL INSPECTORS

At the present time there are 35 special inspectors who have qualified for the type of work to be performed in the construction of buildings involving more than 100 tons of structural steel or 20,000 square feet of concrete floor area, or buildings to be used for public assemblage, the fees for the service of the inspector being paid by the owner.

Since the promulgation of this regulation in July, 1925, there have been approximately 200 projects which were constructed under the supervision of a special inspector.

This office is pleased to note that it has received the cooperation of these inspectors at all times in ascertaining that the building is erected in accordance with the provisions of the building and zoning regulations and the approved plans on file in this office.

ADVISORY COMMITTEE ON REVISION OF THE BUILDING CODE

This committee is composed of many prominent architects and civil engineers in this city, of which the inspector of buildings is chairman.

At the present time this office is engaged in the task of revision of the entire building code, prior to its reprint, and it is hoped that the amendments may be submitted to the commissioners in the very near future.

It is desired at this time to acknowledge the efficient and competent services rendered by the employees of this department during the period, the work having been performed in a prompt and satisfactory manner.

Respectfully submitted.

JOHN W. OEHMANN,
Inspector of Buildings.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE INSPECTOR OF PLUMBING

AUGUST 20, 1929.

SIR: The forty-seventh annual report of the plumbing inspection division covering its operations during the fiscal year ending June 30, 1929, follows.

INSPECTION WORK

There were 29,524 inspections on plumbing work installed, an increase of about 7 per cent over the number made last year, but there were substantially fewer inspections on complaints, which totaled 19,931 as against 27,585 such inspections during 1928. The

special inspections on restaurant work, on sewage-disposal installations, interviews with witnesses in court cases, settlement of questions relating to the application of the regulations, and similar work numbered 2,705, slightly more than last year, and the total number of inspections made was 52,160 as against 57,919 for the fiscal year of 1928. This decrease is wholly attributable to decrease in complaints and relieved the office force of considerable correspondence and preparation and service of notices during a portion of the year. The largest number of inspections made by any inspector in one day was 30 and the yearly average per inspector per day was 13.22. Plans were filed for new construction and extensions and remodeling in an estimated amount of \$2,964,848, an increase over last year of just over 7 per cent, thus agreeing with the increased number of inspections on that class of work. Repairs, additional fixtures, and small extensions for which no plans were filed are estimated at \$745,000, making practically three and three-quarter million dollars worth of plumbing work done in the District of Columbia, exclusive of plumbing in buildings belonging to the District of Columbia, the United States, and foreign governments. This office was accorded a courtesy by the British Government in requesting that regular plumbing inspections be maintained during the construction of the new British Embassy. One United States Government office and two other foreign governments have also availed themselves of this service. This special inspection work is interesting for the care with which the foreign governments plan for permanency in the use of cast iron, brass, and copper piping in the walls to the exclusion of the lighter galvanized steel and iron so much used in local work, and the attention paid to installation details. Such construction might well be adopted in building for the District. On three occasions during the year extremely unusual inspection service was rendered on request. One case had to do with drainage from a bridge into the middle of a river, one with plumbing on a pleasure yacht, and one was a conference on toilet accommodations for a large airplane.

COMPLAINTS

A very large proportion of the complaints investigated had to do with leaking or missing sheet-metal gutters and rain leaders, defective and leaking roofs, improper surface drainage, and water or dampness in cellars. This is not plumbing work, but by reason of the close relation to it such matters seem to be more satisfactorily handled through the laws under which this office operates than as if handled as individual cases by the several offices where such complaints originate. These complaints are responsible for two-thirds or more of all office work of this division, each case requiring the writing of reports, letters to owners or agents, reinspection reports, and in probably one-fourth of the cases notices must be prepared and served, and in a few instances prosecution was had in police court. More than 90 per cent of the complaints handled originate in other offices.

POLICE-COURT WORK

There were 39 warrants obtained during the year—8 for work done by unlicensed plumbers and 31 for violation of commissioners' orders. But 8 cases went to trial, none were lost, and the rest were

nolle prosequi by reason of work being done within extensions granted or before service of warrant. The total fines collected amounted to \$125.

NUISANCE AND DRAINAGE WORK

Twelve cases, involving 15 premises, originating in the health department, and 2 cases, involving 5 premises, originating in this office, were prosecuted to completion and the cost of the work assessed during the fiscal year. There were also two old cases, dating from 1926 and involving four premises, also prosecuted and assessed. There were only 14 cases left unprosecuted at the close of the year, lack of prosecution being due to various reasons, such as ownership being settled in court, property subject to condemnation proceedings, owner obtaining bids, and similar conditions causing delay.

MUNICIPAL PLUMBING WORK

The usual assistance was rendered the municipal architect in advising on plumbing plans and specifications where requested, and in particular a careful inspection of plumbing being installed in schoolhouses and other District structures, reporting on each such inspection and test. Special inspection service was also undertaken in connection with relaying public sewers and water mains and in connection with pavement resurfacing.

REGULATIONS

There have been no changes in the plumbing or gas-fitting regulations during the year, but drafts of a complete change in the gas-fitting regulations and changes in regulations regarding fire and lawn sprinklers and a complete refrigeration code have been drawn up and are awaiting action.

PLUMBING BOARD

The plumbing board held 23 meetings and examined 85 candidates for licensing as master plumber and gas fitter, of whom 11 passed, practically 13 per cent of applicants, although only about 7 per cent passed on their first appearance before the board.

On June 30, 1929, there were 276 licensed as master plumber and gas fitter and 6 licensed as master gas fitter only. A number of these licensed men work for the Government or as journeymen, so there were 226 men actively engaged in business.

PUBLIC-CONVENIENCE STATIONS

During the year 4 convenience stations were in operation daily from 6 a. m. to midnight, with 2 shifts of attendants, each working 9 hours per day. The largest station, that at Seventh Street and Pennsylvania Avenue NW., reported 5,919,320 users; that at Thirteen-and-a-half Street and Pennsylvania Avenue NW., 2,416,080; that at Ninth Street and New York Avenue NW., 3,125,460; that at Fifteenth Street and Maryland Avenue NE., 1,917,480, making a total of about thirteen and one-half million times these stations were used during the year.

The cash receipts from the use of pay compartments, telephone commissions, public scales, shoe-shining machines, etc., amounted to \$5,562.73 being nearly 20 per cent of the cost of the operation of the stations. These receipts are less than for any previous recent year, but the last months show increases comparable to the corresponding months, so that it is expected that the falling off in receipts is but temporary. Funds are available for the construction of a new station in Georgetown, and it is expected that the plans will be completed shortly.

Respectfully,

A. R. MCGONEGAL,
Inspector of Plumbing.

To the INSPECTOR OF BUILDINGS.

REPORT OF THE INSPECTOR OF STEAM BOILERS

AUGUST 28, 1929.

SIR: Respectfully submitting herewith the annual report of the inspector of steam boilers for the fiscal year ended June 30, 1929:

Boilers inspected

Boilers inspected, at \$5 per boiler.....	843
Boilers inspected for the District of Columbia (no fee).....	73
Total number of boilers inspected.....	916

Exceptional conditions found upon inspections of boilers and reinspections

Defective boiler settings.....	5
Defective steam gauges.....	25
Defective tubing.....	50
Pressure reduced on boilers.....	6
Boilers condemned because of their dangerous condition and constituting a public menace.....	8
Reinspections of boilers for compliance with notices to repair, and notices to comply with the A. S. M. E. boiler construction code.....	15
Total.....	¹ 109

Statement of receipts and expenditures

Gross receipts from the inspection of 843 privately owned boilers....	\$4,215.00
Deduct expenditures:	
Printing.....	\$10.00
Loose-leaf binders.....	3.55
Postage.....	4.00
Wearing apparel.....	9.00
Tools.....	10.00
Clerical hire.....	30.00
Cost of bond.....	5.00
Transportation and maintenance of automobile, at \$2 per day (355 days).....	710.00
Total expenditures.....	781.55
Net amount of compensation.....	3,433.45

¹ This total is included in the number of boilers in the above tabulation.

During the period this incumbent has held office it has been his practice unfailingly to report for duty each day and in the course of a day working 9 to 11 hours. In addition to the long hours daily, the position requires the inspection of boilers on Sundays in numerous large plants in the city, where it is impossible to make these inspections during the week because of the necessity for closing their plant and discontinuing business during the interim of the inspection and prior thereto for the cooling of the boiler.

The plants and establishments in which the boilers inspected are located are to be found in the four extremes of the city, oftentimes necessitating travel from one end of the city to the other in the course of a day to inspect boilers for which appointments have been made.

P. M. GREENLAW,
Inspector of Steam Boilers.

To the INSPECTOR OF BUILDINGS.

REPORT OF THE BOARD OF EXAMINERS OF STEAM ENGINEERS OF THE DISTRICT OF COLUMBIA

AUGUST 20, 1929.

GENTLEMEN: The board of examiners of steam engineers has the honor to submit to you their annual report for the year ending June 30, 1929.

The following table shows the work as it progressed each month:

	Meet- ings held	Appli- cants exam- ined	Appli- cants ap- proved	Appli- cants not compe- tent	First class	Second class	Third class	Hoist- ing and port- able	Special class	Gas fired press ma- chine	In- ternal com- bus- tion	Elec- tric motor- driven refrig- erating ma- chine
1928												
July	4	39	34	5	1	1	1	3	1	19	7	1
August	5	40	33	7	1	3	5	5	1	13	5	0
September	4	39	27	12	0	1	3	3	2	15	3	0
October	4	31	22	9	0	0	3	0	2	14	3	0
November	5	43	34	9	3	0	4	4	4	13	6	0
December	4	28	20	8	1	1	0	2	1	13	2	0
1929												
January	4	31	28	3	2	1	6	2	1	12	4	0
February	3	34	25	9	2	1	2	2	0	16	2	0
March	5	56	36	20	1	5	6	0	3	13	7	1
April	4	38	28	10	1	0	2	3	0	17	3	2
May	4	59	41	18	1	0	2	7	1	15	14	1
June	4	59	40	19	0	0	1	12	3	15	9	0
Total	50	497	368	129	13	13	35	43	19	175	65	5

P. M. GREENLAW, *Chairman,*
Inspector of Steam Boilers.

H. BOESCH, *Secretary.*

T. S. TINCHER, *Member.*

To the INSPECTOR OF BUILDINGS.

REPORT OF THE CITY REFUSE DEPARTMENT

AUGUST 16, 1929.

SIR: I have the honor to submit the following report of the operations of the city refuse department for the year ended June 30, 1929:

The collection and disposal of household wastes and the cleaning of the streets and alleys were carried on in quantities, as shown by the appended tables. Funds appropriated by Congress available for this work were \$950,000 for the collection and disposal of refuse and \$500,000 for dust prevention and cleaning of streets and alleys.

The amount of miscellaneous refuse to be collected and disposed of is increasing yearly, and the nuisance arising from burning this material on the dumps became so great this past year as to necessitate the elimination of this method of disposal in the District and the operation of the trash-disposal plant during the night as well as during the day for the greater part of the year. This method of disposal and the operation of two shifts added materially to the cost of this work, and it also has been a severe strain on the furnaces and mechanical appliances at the plant, but the resulting freedom from smoke on the property adjacent to the dumps, where refuse formerly was burned, justified the additional cost. The incinerators authorized by act of Congress approved March 4, 1929, are an urgent necessity, and it is hoped that funds for their construction will be made available soon after the Congress convenes in December.

The garbage-disposal plant produced 2,786,079 pounds of grease, which sold for \$195,203.77. A considerable amount of work, costing over \$8,000, was done at Cherry Hill, Va., in the way of substantial repairs and betterments to this plant. It is expected to continue this work during the coming year.

During the past season it was found necessary to dispose of a considerable amount of trash and street-cleaning material collected by hauling to dumps in Virginia. In all of the several services of this department it is becoming increasingly important to do away with horse-drawn vehicles and to substitute motor trucks. The animals we have are getting too old for heavy work and the hauls to the disposal points have become too long for their satisfactory and economic use. In another year or two it is believed the department should be entirely motorized.

From the appropriation for street cleaning \$12,244.57 was expended last winter for clearing the streets of snow. Two small mechanical snow loaders were purchased and operated successfully.

A general increase in wages was recommended by the wage board and granted the per diem employees during the year. Notwithstanding this increased cost for labor, the work was carried on in increased amounts and the unit costs of the various methods of cleaning and of the other services were kept at a favorable figure. I wish to express my appreciation of the loyal and energetic services of the employees in this department which brought about these satisfactory results.

MORRIS HACKER,
Supervisor, City Refuse.

To the ASSISTANT ENGINEER COMMISSIONER.

Cost of street cleaning, July 1, 1928, to June 30, 1929

	Area (square yards)	Cost	
		Total	Unit per thousand
Machine cleaning, hand.....	99,808,000	\$19,185.00	\$0.192
Alley cleaning.....	111,549,000	60,846.32	.546
Suburban cleaning.....	93,092,000	33,965.44	.365
Hand patrol.....	1,976,348,000	245,414.63	.124
Motor flushing.....	675,092,000	44,597.03	.066
Annual overhead.....		3,918.69	
Property accounting.....		6,062.28	
Dumpmen.....		4,750.80	
Waste-paper boxes.....		5,598.95	
Sunday cleaning.....		4,408.21	
Snow and ice.....		12,244.57	
Dust prevention, oiling.....		10,000.00	
		450,991.93	

Table showing comparative data in connection with street-cleaning work, 1925 to 1929

SQUARE YARDS CLEANED

	1925	1926	1927	1928	1929
Hand patrol.....	1,504,989,000	1,663,576,000	1,739,011,000	1,707,576,000	1,976,348,000
Machine, horse.....	62,171,000	63,627,000	70,843,000	117,465,000	
Machine, hand.....	49,077,000	47,678,000	60,126,000		99,808,000
Alley cleaning.....	92,676,000	94,781,000	103,250,000	113,828,000	111,549,000
Suburban streets.....	41,383,000	50,794,000	57,831,000	61,818,000	93,092,000
Motor flushing.....	323,825,000	566,451,000	705,056,000	771,793,000	675,092,000

DIRECT TOTAL COST

	\$213,380.68	\$198,294.05	\$211,723.96	\$207,177.05	\$245,414.63
Hand patrol.....					
Machine, horse.....	20,767.74	21,411.41	22,622.29	31,790.69	
Machine, hand.....	11,247.17	9,899.26	10,567.10		19,185.00
Alley cleaning.....	53,238.58	56,616.73	58,839.96	57,987.95	60,846.32
Suburban streets.....	21,369.26	25,147.79	25,894.34	25,304.14	33,965.44
Motor flushing.....	24,773.56	38,237.62	50,299.00	48,868.23	44,597.03

COST PER 1,000 SQUARE YARDS

	\$0.142	\$0.124	\$0.122	\$0.121	\$0.124
Hand patrol.....					
Machine, horse.....	.334	.337	.319	.271	
Machine, hand.....	.229	.208	.176		.192
Alley cleaning.....	.575	.598	.571	.509	.546
Suburban streets.....	.516	.495	.447	.410	.365
Motor flushing.....	.077	.0675	.0714	.0634	.066

Table showing comparative data in connection with disposal of all city waste from 1925 to 1929

NUMBER OF UNITS COLLECTED

	1925	1926	1927	1928	1929
Garbage.....	72,927	68,907	77,554	72,646	73,495
Ashes.....	154,982	168,280	165,388	161,822	167,466
Miscellaneous refuse.....	197,890	215,320	236,519	245,892	265,190
Night soil.....	17,727	18,653	18,648	18,654	18,654
Dead animals.....	43,609	43,624	47,064	44,976	47,309

Table showing comparative data in connection with disposal of all city waste from 1925 to 1929—Continued

TOTAL NET COST

	1925	1926	1927	1928	1929
Garbage.....	\$200,292.77	\$186,530.56	\$288,783.28	\$243,984.85	\$247,919.28
Ashes.....	133,484.49	137,893.99	123,711.99	130,367.21	125,474.75
Miscellaneous refuse.....	101,539.75	130,733.18	135,950.48	150,214.12	177,045.16
Night soil.....	24,000.00	24,000.00	22,600.00	22,600.00	22,600.00
Dead animals.....	4,668.84	7,126.34	9,308.85	5,214.12	3,248.63

MISCELLANEOUS DATA ON CONTRACT

Class of waste	Contractor	Period of contract	Date of expiration	Price per annum	Collected from—
Night soil....	Warner Stutler....	3 years....	June 30, 1929	\$22,600.00	All privies in the district.

REPORT OF THE ELECTRICAL ENGINEER

SEPTEMBER 1, 1929.

SIR: The annual report of the operations of the electrical department for the fiscal year ended June 30, 1929, is respectfully submitted herewith.

FUNCTIONS

The work of the electrical department includes (a) the street lighting, electric and gas, designation lights and signs indicating location of fire-alarm boxes, etc., and street designation signs; and the maintenance of the traffic signal lights (the installation and operation of these latter being in the jurisdiction of the director of traffic); (b) the municipal signals and communication system; (c) the regulation of production, use and control of electricity and installation of wires and apparatus for electric light, heat, and power purposes in the District of Columbia, the regulation of poles and overhead wires in public space, and (jointly with other divisions concerned) regulation of underground electrical constructions in public space; (d) consultation and advisory service to other divisions and departments of the District government.

STREET LIGHTING

The street-lighting system at the beginning of the fiscal year consisted of 26,348 lamps—10,016 gas and 16,332 electric (1,292 arc, 15,040 incandescent); on June 30, 1929, there were in service 27,513 lamps—8,958 gas and 18,555 electric (1,425 arc, 17,130 incandescent), a total net increase of 1,165 lamps, compared with 1,375 in 1928, 1,587 in 1927, and 819 in 1926. Of the 3,541 lamps newly connected (gross, 2,376, having been discontinued), 410, about 11½ per cent, were either designation lamps or of the next lowest powered gas or electric. This percentage compares with 12½, 17, and 35 for the prior years, 1928, 1927, and 1926, respectively, indicating a continued growing proportion of larger and more efficient and economical units. The increase in total number of lamps connected is 4.42 per cent, compared with 5.51 per cent, 6.79 per cent, and 3.63 per cent in each

of the three next preceding years. The increase in aggregate candlepower of the street-lighting system is from approximately 6,037,000 to approximately 6,865,000, about $13\frac{3}{4}$ per cent, compared with $38\frac{1}{2}$, 53, and 30 per cent in the three next preceding years. The increase in annual charges is, however, only about $8\frac{2}{3}$ per cent. The total gas lighting has been, on the other hand, reduced by more than $11\frac{1}{2}$ per cent and to less than 8 per cent of the total candlepower, bearing about 20 per cent of the total annual charges. The cost in annual rate charges on the total installation as of June 30, 1929, was at the rate of 11.44 cents per candlepower year, compared with 11.97—cents on that as of June 30, 1928.

The relative economy of the large units, where their use is justified, may be indicated by the statement that the duplex 6.6-ampere arc, provides light at the rate of 6.5 cents per candlepower year; the duplex 1,000 candlepower incandescent at 6.91 cents, the duplex gas lamp, 120 candlepower, at 21.1 cents, the 60-candlepower electric at 24.2 cents, and the single burner, 60-candlepower gas lamp at 27.9 cents; the intermediate sizes at intermediate costs.

The approved project of improved lighting has been further advanced, but with special attention transferred for the present from main arteries to secondary thoroughfares; more than 70 per cent of the increased candlepower by incandescent lamps was by the relatively small 250-candlepower lamps.

ARC LIGHTING

There has been a net increase of 150 in the number of 6.6-ampere magnetite arc lamps to 1,386 (1,116 mounted single and 270 in duplex), and a decrease of 17 in the number of 4-ampere magnetite arc lamps to 39, a net increase of 133 in the total number of arc lamps to 1,425. There remain yet to be replaced 39 of the less efficient 4-ampere arcs. The better type, on the new design ornamental posts, have been installed during the year on Ninth Street NW., from Pennsylvania Avenue to U Street.

INCANDESCENT ELECTRIC LIGHTING

The number of incandescent lamps added (other than designation lamps), is 3,207 (14 of 1,000, 191 of 600, 553 of 400, 2,057 of 250, 58 of 100, and 334 of 60 candlepower); discontinued, 1,181 (1 of 600, 32 of 400, 110 of 250, 446 of 100, and 592 of 60 candlepower), a net increase of 2,026. The total number of incandescents connected June 30, 1929, was 16,676, compared with 14,650 at the close of the preceding year. Of the less economical sizes, 100 candlepower and 60 candlepower, which will have little place in the completed new project, 1,038 were discontinued, but 392 were added, reducing the total of these sizes by 646, to 5,398, of which 1,152 are connected on underground and 4,246 on overhead wires. Prominent items of the new incandescent lighting are: Tennessee Avenue from Lincoln Park to Fifteenth Street NE.; South Dakota Avenue from Rhode Island Avenue to Bladensburg Road NE.; South Carolina Avenue from Second to Fifteenth Streets SE.; Minnesota Avenue from Pennsylvania Avenue to Eight-

eenth Street SE.; North Carolina Avenue from E to Eleventh Streets SE.; Potomac Avenue from Eighth to Nineteenth Streets SE.; Virginia Avenue from Second to Eleventh Streets SE., and from B to Twenty-sixth Streets NW.; Kentucky Avenue from Lincoln Square to Pennsylvania Avenue SE.; R Street from Sixth Street to Massachusetts Avenue NW.; Military Road from Georgia Avenue to Forty-first Street NW.; Canal Road from Thirty-seventh Street to Chain Bridge NW.; Conduit Road from Foxhall Road to District line NW.; area bounded by Cathedral Avenue, Woodley Road, and Twenty-ninth Street NW.; area bounded by Wisconsin Avenue, Reservoir Road, and Thirty-seventh Street NW.

MANTLE GAS LIGHTING

All gas street lighting, as such, is by mantle burners; this subtitle excludes the "designation" lamps, used almost exclusively to mark fire-alarm boxes, which are a flat flame.

The number of mantle gas lamps added was 38, discontinued 1,027, a net decrease of 989. The total connected June 30, 1929, was 8,770 (8,412 60-candlepower, 358 120-candlepower), compared with 9,759 (9,202 60-candlepower, 557 120-candlepower) at the close of the preceding year. The 60-candlepower are single burner, the 120-candlepower double burner. In total mantles there were 9,128 connected June 30, 1929, compared with 10,316 at the close of the preceding year, a decrease of 1,188, compared with decreases of 1,270 and 1,043 and an increase of 565 mantles in the three next preceding years.

The improvement of lighting of main thoroughfares, of especial traffic hazard, has been carried to the point where a larger proportion of gas replacement in the immediate future is expected.

DESIGNATION LAMPS

The number of designation lamps added was 65 (all electric), discontinued 70 (69 gas, 1 electric), a net decrease of 5, compared with net increases of 8 and 18 and decrease of 13 in the next three preceding years. The number of designation lamps connected June 30, 1929, was 642 (188 gas, 454 electric), compared with 647 (257 gas, 390 electric) at the close of the preceding year.

TRAFFIC SIGNAL LIGHTS

The traffic signal lights in service June 30, 1929, were as follows:

Isolated 4-way (with amber overlap)-----	3
Single-face, 1-way, 50-watt-----	66
Single-face, 1-way, 60-watt, without amber overlap-----	24
Single-face, 1-way, 60-watt, 50-second cycle, 10-second amber overlap-----	560
Single-face, 1-way, 60-watt, 60-second cycle, 15-second amber overlap-----	22
Traffic beacons-----	14
Mushroom-type fixture-----	34
Total-----	723
Total in service June 30, 1928-----	200
Added-----	600
Discontinued-----	77

SIGNALS SYSTEM

The signals system comprises (a) the municipal fire-alarm-telegraph system, with central office at District Building, with circuits radiating to fire-alarm boxes, distributed throughout the District, and with circuits connecting each of the fire department apparatus stations; (b) the police-patrol signal system, consisting of 14 groups of distributed signal stations, each group centering at a police station; and (c) the municipal telephone system; of this latter, one 6-position and two 2-position P. B. X., class C switchboards (located in the District Building) with 56 trunk lines, 4 interdepartmental tie lines, etc., and 13 P. B. X., class B switchboards (each located at a police station), constitute the nuclei, which apparatus, together with 1,881 sets of telephone instruments (transmitter and receiver only), are rented from and maintained by Chesapeake & Potomac Telephone Co. The desk stands, wall boxes, cords, and connecting station lines in the District Building and radiating from that building to and in other buildings to the telephone instruments are owned, installed, and maintained by the District. Of the two 2-position switchboards in the District Building, one is the fire department auxiliary, serving that department for general administrative purposes, but is located in fire-alarm headquarters and is an integral part of the fire-alarm system, supplemental to the telegraph code signaling, and, like the 6-position board, is operated by electrical department personnel; the other is police headquarters switchboard, there located, and operated by police department personnel. The three switchboards are intimately tied, providing much flexibility of routing. The three sections of signal service are joined in a common system of characteristic lead-covered, dry paper tape insulated cables, for general distribution, in very large proportion underground. This type of cable is not that prescribed by National Board of Fire Underwriters for fire-alarm distribution service, but is much more economical, both in first cost and in maintenance, and, with our unique combined system, is as reliable and satisfactory; maintenance of high insulation is as good, barring casualties; when subjected thereto, it more quickly develops fault, but in the combined system, the telephone switchboard is an alert telltale of cable trouble, and it has been proven for years that condition maintenance is accomplished as well and with much less time spent in daily testing by instruments.

Fire-alarm boxes added to the system during the year number 1, private (at McKinley High School, Second and T Streets NE.); none were discontinued, a net increase of 1, to a total in service June 30, 1929, of 943 (747 public and 196 private). Four existing boxes were changed from overhead to underground connection. Boxes connected underground were increased by 5, to a total of 813, and boxes connected by overhead wires were decreased by 4, to a total of 130. A "private" box is one so located as to especially serve some special interest, not freely accessible to the public in general, and for which the cost of the immediate installation, including the box and connection to nearest available circuit, is borne by the specially interested party. The number of public boxes, 0, added to the system, compares with 23, 33, 33, and 29 in the four preceding years.

Careful and continuous inspection, maintenance, and repair service on the apparatus and connecting wire system has been maintained. Each fire-alarm box was tested repeatedly during the year, contact points cleaned, and mechanism proven to be or made to be in good order. The box tests totaled 3,840. Circuit tests are made at headquarters systematically twice a day and frequently on occasion.

The number of fire alarms of all kinds received and transmitted through fire-alarm headquarters was 4,213, compared with 3,747, 3,491, 3,983, and 2,908 in the four next preceding years; this includes 28 "additional" alarms (14 second, 5 third, 5 fourth, 2 fifth, 1 sixth, and 1 special) compared with 43 "additional" alarms (23 second, 11 third, 5 fourth, 3 fifth, and 1 special) in the next preceding year. It also includes 301 false alarms (192 box and 109 local), compared with 299, 379, 297, and 227 in the four next preceding years, the false box alarms, 192, being under 13 per cent of the total regular box alarms (1,503), compared with 14, 20, 13, and 13 in the four next preceding years; nearly 54 per cent of the regular box alarms occurred in the 42 per cent of the year, the months November to March, both inclusive; for the local alarms, April is added to the months having more than the average number; September is the minimum for both classes; there seems to be no season for false alarms, May having the maximum of false box alarms, 26, compared with an average of 16, and January the maximum of false local alarms, 15, compared with an average of 9.

The number of police-patrol boxes added was 4, discontinued 1, a net increase of 3, to a total connected of 533. Two boxes were changed from overhead to underground connection, the 533 present being connected—438 underground and 95 overhead.

The number of telephones added, connected to the two switchboards under the operating jurisdiction of this department (the main District of Columbia P. B. X. National 6000, and the fire-alarm headquarters P. B. X. National 0020) was 37, and 21 were discontinued, a net increase of 16, compared with 11, 6, 19, and 11 in the four next preceding years. Connected to other District switchboards, nearly all of which are tie-line connected to National 6000, 50 were added and 5 discontinued, a net increase of 45. The number of telephones of the entire District of Columbia system was increased by 61 (compared with 24, 68, 64, and 39 in the four next preceding years), to a total connected June 30, 1929, of 1,881, exclusive of 29 portable sets in service, the property of the District of Columbia, used by the fire department and the electrical department in field service.

The number of cells of storage battery in service on fire-alarm, police-patrol, and local circuits remains at 2,692, as last previously reported. The distribution equipment for the composite-signals system (fire alarm, police patrol, and telephone) has been affected by the installation of 6 manholes, 4,036 duct feet of conduit, and 3.27 miles of underground cable, containing 124.73 miles of conductor, the withdrawal of 0.02 mile of underground cable, containing 0.33 mile of conductor; a net increase of approximately 3.25 miles of underground cable containing approximately 124.4 miles of conductor.

Grand total of composite distribution in service June 30, 1929, 223.39 miles cable, 8,751.15 miles conductor (8,669.6 miles underground and 181.9 miles overhead), i. e. 99 per cent of our signals-distribution conductor is underground, but much of it is on too narrow a margin of reserve capacity.

The utilization of radiocommunication in certain municipal functions is being further considered.

POLES AND OVERHEAD WIRES

The regulation of the erection of poles, the stringing of overhead wires, and the maintenance of same in safe condition in the streets and other public spaces has been carried on in accordance with law and regulations.

The various wire-using companies have during the year newly erected 1,330 line and guy poles and 450 anchors; have moved, replaced, and reset 1,607 line and guy poles; and have taken down and removed 381 line and guy poles and 41 anchors, resulting in an aggregate net increase during the year of 949 poles (914 line and 35 guy), bringing the record total of electric poles on June 30, 1929, to 29,273 (27,469 line and 1,804 guy).

The list of pole owners comprises the United States, the District of Columbia, and 15 companies (the steam railroads being lumped as one); nearly 83 per cent of the poles are owned by and 90 per cent of the record increase is by two of the companies, Chesapeake & Potomac Telephone Co. and Potomac Electric Power Co., in about a 1 to 2 ratio; the activities in erecting, taking down, moving, replacing, and resetting are confined to 8 of the parties; two, Columbia Railway Co., and Western Union Telegraph Co., effected a net decrease, taking down, respectively, 45 of 468 and 4 of 838. The United States owns 298 and the District of Columbia owns 463 of the 29,273 poles of record, a combined Government ownership of about 2.6 per cent of the total. The increase of total, 949, compares with 810, 1,940, 1,724, and 794, of the four next preceding years; 8 telephone poles have been erected and 3 taken down in streets within "the prescribed area," an increase of 5, compared with decreases of 4 and 3 and increases of 1 and 1 in each of the four next preceding years. The joint-use arrangement by and between the two most active companies continues.

ELECTRIC INSPECTION—WIRES AND APPARATUS

In the operations under the act of Congress to regulate electric wiring in the District of Columbia, approved April 26, 1904, and the regulations thereunder:

The total number of permits issued in connection with the installation of wires and apparatus on private property was 14,947, compared with 12,639, 14,144, 15,267, 13,109, and 9,495 in the five next preceding years. Fees paid to the collector of taxes for permits, inspections, and rules and regulations, \$30,614.20, compared with \$24,390.10, \$24,372.55, \$23,912, \$21,290, and \$16,264 in the five next preceding years.

Number of inspections recorded, 37,079, compared with 30,072, 29,793, 28,212, 25,418 and 21,827 in the five next preceding years.

A sixth edition of rules and regulations has been prepared and was promulgated by the Commissioners of the District of Columbia by an order dated May 7, 1929, to be in effect on and after October 1, 1929.

The then new scale of fees promulgated with fifth edition of rules and regulations, effective February 15, 1927, provided something toward equity of affairs, but less than was intended; the new scale, effective October, 1929, is intended to produce a small further increase of revenue.

MISCELLANEOUS WORK

The department cooperated with heads of other divisions and departments, particularly in matters of rate for electric service, advice on purchases, etc.

WARREN B. HADLEY,
Electrical Engineer.

To the ASSISTANT ENGINEER COMMISSIONER.

SEPTEMBER 1, 1929.

SIR: I have the honor to submit herewith the annual reports of the municipal architect, including the reports of the superintendent of repairs and the constructing engineer at the workhouse and reformatory; the assistant superintendent of the District Building; and the superintendent of the municipal garage, for the fiscal year ended June 30, 1929.

Respectfully,

LAYSON E. ATKINS,
Major, Corps of Engineers, United States Army,
Assistant.

To the ENGINEER COMMISSIONER.

REPORT OF THE MUNICIPAL ARCHITECT

AUGUST 27, 1929.

SIR: I have the honor to submit herewith the following report of the operations of the office of the municipal architect for the fiscal year ended June 30, 1929:

The work in the municipal architect's office consists of the preparation of plans, specifications, and superintendence of the construction of all buildings erected by the District of Columbia, consisting chiefly of schools, fire-engine houses, police stations, hospitals, and, in addition, the preparation of drawings and estimates for new buildings and repairs to existing buildings for the various municipal institutions, such as the Home for the Aged and Infirm at Blue Plains, the National Training Schools for Boys and Girls, and the District Training School near Laurel, Md. Plans for all buildings are submitted to the Commission of Fine Arts for approval before work on contract plans is begun.

The repair shop, which is an adjunct to the municipal architect's office, is charged with the upkeep and repair work required for the various buildings of the school system, as well as other municipal

institutions. A separate report on the repair shop is forwarded herewith.

The development of plans and the construction of buildings for the reformatory and workhouse at Lorton, Va., also come under this office, and the report of the engineer in charge is forwarded herewith.

The following buildings were under construction at the time of the submission of the last annual report and have since been completed:

McKinley High School, located on Second Street between R and T Streets NE.: By the deficiency act of June 7, 1924, \$5,000 was appropriated for the preparation of plans and specifications for a new school building for the McKinley Manual Training School. By the act of March 4, 1925, \$1,000,000 was appropriated for beginning the construction of new buildings for the McKinley Technical High School, and the commissioners were authorized to enter into contract or contracts for such buildings at a cost, exclusive of the treatment of the grounds, not to exceed \$2,250,000. By the act of March 2, 1927, an additional sum of \$1,000,000 was appropriated for continuing the construction of said buildings. By the act of May 21, 1928, an additional sum of \$250,000 was appropriated for completing the construction of said buildings. Contract was executed July 2, 1926, with Parsons & Hyman for the construction of three units, namely, main building, including auditorium, etc., gymnasium and power house, including plumbing, heating and ventilating, and electrical work, to be known as the McKinley High School, in the sum of \$1,974,644. The contract time expired June 1, 1928, but was extended to September 14, 1928, at which time the work was completed, at a cost of \$2,022,301.91. Cubic contents, 5,790,000 cubic feet; cost per cubic foot, 34.9 cents. Contract was entered into March 1, 1927, with the W. G. Cornell Co., in the sum of \$17,034, for furnishing and installing a vacuum-cleaning system. This work was completed August 30, 1928, at a cost of \$17,334. Contract was entered into June 26, 1928, with Boyle-Robertson (Inc.), in the sum of \$1,981, for removing cupola over foundry of the McKinley Manual Training School to the McKinley High School. This work was completed August 6, 1928, at the contract price. Contract was entered into August 10, 1928, with Harry Wollman, in the sum of \$40,800, for clearing, grading, etc., the joint site of the Langley Junior and McKinley High Schools. The contract time expired November 28, 1928. This work has not been completed. Contract was entered into January 15, 1929, with the Art Metal Construction Co., in the sum of \$1,750, for furnishing and installing metal bookstacks in the McKinley High School. The work was completed April 10, 1929, at the contract price. Contract was entered into May 24, 1929, with Arthur L. Smith & Co., in the sum of \$198,700, for the construction of a stadium and making roads, walks, etc., on the joint site of the Langley Junior and McKinley High Schools. The contract time for the completion of this work is May 1, 1930. Contract was executed June 28, 1929, with the English Construction Co., in the sum of \$1,292, for furnishing and erecting targets and accessories at the rifle range in this schools. The contract time expires July 28, 1929.

Gallinger Municipal Hospital, located in reservation No. 13, east of Nineteenth and south of B Streets SE.: By the act of May 10, 1926,

\$300,000 was appropriated for continuing the construction of the domestic building and commencing the construction of an additional ward building of not less than 250 beds, including mechanical and other equipment, furniture, and furnishings, at a total cost not to exceed \$1,000,000, which should include any unexpended balances remaining of appropriations theretofore made for buildings at said hospital and the amount by said act appropriated. The act further provided that of said authorized total cost not less than \$75,000 should be available only for the furniture, furnishings, and equipment of said ward building. The balance remaining from former appropriations for buildings at said hospital was, on July 1, 1926, \$180,473.22. By the act of May 21, 1928, \$465,000 was appropriated for completing the construction of the domestic service and ward buildings, subject to the limitations prescribed by the act of May 10, 1926, and for the purchase and installation of new boiler and accessories, and for sewer and water connections, roads, walks, and improvements to grounds. By the act of February 25, 1929, \$49,000 was appropriated for completing the construction of the domestic service and ward buildings, subject to the limitations prescribed in the act for the fiscal year 1927; for purchase and installation of new boiler and accessories; and for sewer and water connections, roads, walks, and improvement of grounds (available July 1, 1929). Contract was executed June 3, 1927, with George E. Wyne for continuing the construction of the domestic or service building and the construction of ward building No. 4, including mechanical equipment, in the sum of \$734,800. This work was completed May 15, 1929, at a cost of \$751,872.78. The vacuum system of heating was installed in these buildings. Cubic contents, 1,345,700 cubic feet; cost per cubic foot, 55.8 cents. Contract was entered into December 14, 1928, with the D. W. Chapman Co. for remodeling the power plant at the hospital, in the sum of \$45,970. This work was completed March 1, 1929, at a cost of \$46,039. Contract was entered into February 13, 1929, with Catlins' (Inc.), in the sum of \$8,900, for furnishing and installing electric lighting fixtures in the service building and ward building No. 4. This work was completed May 13, 1929, at the contract price. Contract was entered into April 9, 1929, with Ira Thomas Brant, in the sum of \$11,180, for the construction of roads, walks, etc., in the hospital grounds. This work was completed June 5, 1929, at a cost of \$11,487.26.

Gordon Junior High School, located between Thirty-fourth and Thirty-fifth Streets, south of U Street NW.: By the act of May 10, 1926, \$200,000 was appropriated for the erection of a junior high-school building on the site purchased for that purpose in Georgetown, according to the plans of the Macfarland Junior High School, modified as the limits of the site might require, and the commissioners were authorized to enter into contract or contracts for such building at a cost not to exceed \$475,000. By the act of March 2, 1927, an additional sum of \$275,000 was appropriated for the construction of said building. Contract was executed November 25, 1927, with George E. Wyne for the construction of said building, including mechanical equipment, in the sum of \$459,900. The work was completed November 3, 1928, at a cost of \$459,347.80. The vacuum system of heating was installed in this building. Cubic contents, 1,694,908 cubic feet; cost per cubic foot, 27 cents.

Barnard School, located on Decatur Street between Fourth and Fifth Streets NW.: By the act of March 2, 1927, \$175,000 was appropriated for the construction of an 8-room addition to this school, including gymnasium and assembly hall. Contract was executed December 31, 1927, with John B. Ginechesi (Inc.), in the sum of \$108,133, for this construction work, including mechanical equipment. The work was completed September 6, 1928, at a cost of \$108,239. The vacuum system of heating was installed in this addition. Cubic contents, 366,791 cubic feet; cost per cubic foot, 29.5 cents.

Garnet-Patterson Junior High School, located between U, V, and Tenth Streets and Vermont Avenue NW.: By the act of May 10, 1926, \$200,000 was appropriated for the erection of an extensible junior high-school building to replace the then existing Garnet-Patterson School Building, in accordance with the plans of the MacFarland Junior High School, modified as the limits of the site might require, and including the removal of one or both of the then existing buildings as might be necessary, and the commissioners were authorized to enter into contract or contracts for the construction of said building at a price not to exceed \$475,000. By the act of May 2, 1928, an additional sum of \$275,000 was appropriated for the completion of the building. Contract was executed October 7, 1927, with the Charles H. Tompkins Co., in the sum of \$372,140, for the construction of said building, including mechanical equipment, plumbing, electrical, heating, and ventilating work, with the exception of the construction of the gymnasium wing, as called for in the original drawings and specifications. This omission was made with the understanding that the gymnasium wing, etc., should be constructed for the sum of \$158,720, in the event the Commissioners of the District of Columbia should secure by congressional appropriation the funds necessary for said construction. The deficiency act of December 22, 1927, provided that \$80,000 of the unobligated balances of various appropriations for the fiscal year 1927 should be made applicable for the construction work on this building. An order of the commissioners was issued January 10, 1928, for the construction of the work omitted, as aforesaid, for the sum of \$158,720. The work was completed at a cost of \$535,223.40. The vacuum system of heating was installed in this building. Cubic contents, 1,724,310 cubic feet; cost per cubic foot, 31 cents. Contract was entered into February 26, 1929, with the Highbridge-International Co. in the sum of \$1,999.94, for furnishing and erecting a sectional steel flagpole, including base, foundations, and all approach work at said building. This work was completed June 7, 1929, at the contract price.

Potomac Heights School, located on Hurst Terrace and Dana Place NW.: By the act of March 2, 1927, \$85,000 was appropriated for the erection of a 4-room extensible building in Potomac Heights. By the second deficiency act of May 29, 1928, an additional amount of \$24,000 was appropriated for the erection of this building. Contract was executed March 9, 1928, with Skinker & Garrett for the construction of said building, in the sum of \$76,825. The work was completed November 1, 1928, at a cost of \$91,094.30. The gravity heating system was installed in this building. Cubic contents, 253,025 cubic feet; cost per cubic foot, 36 cents. Contract was entered into October 23, 1928, with Latimer & Maloney, in the sum

of \$2,700, for grading the site of said school. This work was completed November 12, 1928, at the contract price. Contract was entered into November 30, 1928, with Skinker & Garrett, in the sum of \$626, for furnishing and erecting a flagpole on said site. The work was completed January 25, 1929.

Margaret Murray Washington School, located on O Street, between North Capitol and First Streets NW.: By the act of March 2, 1927, \$150,000 was appropriated for the construction of an 8-room addition to the Margaret Murray Washington Vocational School, including the necessary remodeling of the old building. Contract was executed May 1, 1928, with the C. A. Hofferberth Construction Co., in the sum of \$105,588, for the construction of this addition. The work was completed December 13, 1928, at a cost of \$106,847.27. The vacuum system of heating was installed in this building. Cubic contents, 608,721 cubic feet; cost per cubic foot, 17.5 cents.

District Training School, near Laurel, Md.: By the act of March 2, 1927, \$150,000 was appropriated for the construction of two additional dormitory buildings. Contract was executed June 19, 1928, with Bahen & Wright, for the construction of these dormitories, in the sum of \$137,750. The work was completed April 3, 1929, at a cost of \$139,090.26. Cubic contents, 358,000 cubic feet; cost per cubic foot, 38.4 cents.

By the act of March 2, 1927, \$9,000 was appropriated for the construction of a cow barn, hayloft, and equipment, at the above-named institution. Contract for this work was executed June 19, 1928, with Bahen & Wright, in the sum of \$11,500. The work was completed April 3, 1929, at the contract price. Cubic contents, 87,000 cubic feet; cost per cubic foot, 13.2 cents.

By the act of March 2, 1927, \$5,000 was appropriated for the construction of an implement and tool house at the above-named institution. Contract for this work was executed June 19, 1928, with Bahen & Wright, in the sum of \$6,050. The work was completed April 3, 1929, at the contract price. Cubic contents, 37,000 cubic feet; cost per cubic foot, 16.3 cents.

It will be noted that the contract prices for the construction of the cow barn, hayloft, etc., and for the implement and tool house exceeded the amounts of the appropriations for these projects. The inadequacy of the appropriations to cover the prices for this work, for which bids were received April 24, 1928, was remedied by the second deficiency act of May 29, 1928, which provided that not to exceed \$3,600 of the appropriation for the erection of the two additional dormitories, contained in the District of Columbia appropriation act for the fiscal year 1928, should be made available as an additional amount for the erection of the cow barn and hayloft, including equipment, and the construction of an implement and tool house, for which appropriations were made in said act.

By the act of May 21, 1928, \$18,500 was appropriated for the construction of a steel-girder bridge across Little Patuxent River, at the District Training School. Contract was executed November 3, 1928, with the Forbes-Murphy Construction Co. for the construction of this bridge, in the sum of \$17,736. The work was completed April 1, 1929, at the contract price. Contract was executed Septem-

ber 14, 1928, with the Hachmeister-Lind Co., in the sum of \$1,692, for laying asphalt mastic flooring in the laundry building at the District Training School. This work was completed October 4, 1928, at the contract price.

By the act of May 21, 1928, \$9,000 was appropriated for artesian wells, pumps, and necessary water lines at said institution. Contract was executed April 26, 1929, with the Virginia Machinery & Well Co. (Inc.), for drilling a deep well. The work on this well has not been completed. Contract was executed June 28, 1929, with Sydnor Pump & Well Co. (Inc.) for drilling deep well and furnishing pumping equipment on the farm of the above-named institution. The work on this well has not been completed.

BUILDING CONSTRUCTION STARTED SUBSEQUENT TO JULY 1, 1928

Tuberculosis Hospital, located on Fourteenth between Shepherd and Upshur Streets NW.: Contract was entered into June 29, 1928, with Calvert-Bruce, in the sum of \$1,606, for the construction of a penthouse over the elevator shaft. The work was completed August 30, 1928, at the contract price.

Electrical department storehouse, located on D between Twelfth and Fourteenth Street SW.: By the act of March 2, 1927, \$9,000 was appropriated for the erection and equipment of an addition to the storehouse, to be used for the examination, repair, and storage of material and supplies of the electrical department, including the inclosing, grading, and improvement of the ground. By the act of May 21, 1928, an additional amount of \$2,000 was appropriated for completing the erection and equipment of the addition, including the inclosing, grading, and improvement of the ground. Contract was executed June 29, 1928, with Kuldell Bros., in the sum of \$10,700, for the construction of the addition. The work was completed November 10, 1928, at the contract price. Cubic contents, 53,760 cubic feet; cost per cubic foot, 19.9 cents.

Addition to gymnasium and assembly hall to the Wheatley School, located at Montello Avenue and Neal Street NE.: By the act of March 2, 1927, \$1,500 was appropriated for the preparation of plans and specifications for a combination gymnasium and assembly hall for this building. By the act of May 21, 1928, not to exceed \$60,000 of the unexpended balances in the appropriations for the construction of combined gymnasiums and assembly halls at the Petworth and West Schools was made available for the construction of said gymnasium and assembly hall. Contract was executed July 13, 1928, with the Schneider-Spliedt Co., in the sum of \$38,990, for the construction of the gymnasium and assembly hall addition and making alterations to the existing building, including mechanical equipment, plumbing, electrical, heating, and ventilating work. The work was completed January 3, 1929, at a cost of \$39,426.58. The vacuum system of heating was installed in this addition. Cubic contents, 205,300 cubic feet; cost per cubic foot, 18.9 cents.

Addition to Bryan School, located on B Street between Thirteenth and Fourteenth Streets SE.: By the act of March 2, 1927, \$125,000 was appropriated for the construction of a 6-room addition to the Bryan School, including the necessary remodeling of the old build-

ing. Contract was executed July 24, 1928, with Skinker & Garrett, in the sum of \$80,584, for the construction of this addition, including mechanical equipment, heating, ventilating, plumbing, and electrical work, including the remodeling of the old building. The work was completed March 26, 1929, at a cost of \$86,559.79. The vacuum system of heating was installed in this addition. Cubic contents, 195,000 cubic feet; cost per cubic foot, 41.3 cents.

Plumbing improvements at the Garfield School, located on Hamilton Road SE.: Contract was executed August 28, 1928, with Joe High, in the sum of \$7,684, for furnishing and installing toilet-room fixtures, including partitions, piping, and a septic tank, at said school building. The work was completed October 1, 1928, at the contract price.

E. A. Paul Junior High School, located on Eighth and Nicholson Streets NW.: By the act of March 2, 1927, \$5,000 was appropriated for the preparation of plans and specifications for the erection of an extensible junior high school building in Brightwood, in accordance with the plans of the Macfarland Junior High School, modified as the limits of the site might require. By the act of May 21, 1928, \$250,000 was appropriated for the construction of the building, to be known as the E. A. Paul Junior High School, and the commissioners were authorized to enter into contract or contracts for such construction at a cost not to exceed \$500,000. By the act of February 25, 1929, an additional sum of \$250,000 was appropriated for the construction of said building. Contract was executed September 14, 1928, with the George Hyman Construction Co., in the sum of \$484,850, for the construction of this building, including all approach work, mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire December 1, 1929. The obligations for the contract work to date are \$484,642. The vacuum system of heating will be installed in this building. Cubic contents, 1,504,000 cubic feet; cost per cubic foot, 32.2 cents.

John Quincy Adams School, located at Nineteenth Street and Columbia Road NW.: By the act of March 2, 1927, \$12,500 was appropriated for the preparation of plans and specifications for the erection of a 24-room building, including a combination gymnasium and assembly hall, on a site purchased by the District at Nineteenth Street and Columbia Road. By the act of May 21, 1928, \$250,000 was appropriated for the erection of an elementary school building, including a combination gymnasium and assembly hall, on the site above named, to replace the Force, Adams, and Morgan Schools, and the commissioners were authorized to enter into contract or contracts for the erection of such building at a cost not to exceed \$500,000. By the act of February 25, 1929, an additional sum of \$225,000 was appropriated for completing the construction of said building. Contract was executed September 19, 1928, with the North-Eastern Construction Co., in the sum of \$460,037, for construction of this building, as called for in the act of May 21, 1928, including mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire December 1, 1929. Obligations on the contract work to date are \$461,953. The vacuum system of heating will be installed. Cubic contents, 1,219,680 cubic feet; cost per cubic foot, 37.7 cents.

Improvements to Georgetown playground, located between Thirty-third, Thirty-fourth, Q Streets, and Volta Place NW.: Contract was executed October 19, 1928, with the G. B. Mullin Co. (Inc.), in the sum of \$2,500, for the removal of the wall on the east side of the playground and the construction in lieu thereof of a reinforced concrete retaining wall, with wood and metal fence at top. The work was completed March 7, 1929, at the contract price.

Improvements to site of Whittier School, located at the southeast corner of Fifth and Sheridan Streets NW.: Contract was executed September 19, 1928, with Bright-Shepherd (Inc.), in the sum of \$3,890, for grading site, including removal of trees, excavating, filling, removal of surplus earth, etc. The work was completed October 4, 1928, at the contract price.

Building to replace the Langdon School, located at Evarts and Twentieth Streets NE.: By the act of March 2, 1927, \$275,000 was appropriated for the erection of a 16-room building, including a combination gymnasium and assembly hall, to replace the existing Langdon School Building. Contract was executed November 20, 1928, with the G. G. Lochler Construction Co., in the sum of \$261,300, for the construction of this building, as called for in the act of March 2, 1927, including mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire September 16, 1929. The contract obligations to date are \$261,300. The vacuum system of heating will be installed. Cubic contents, 991,000 cubic feet; cost per cubic foot, 26.5 cents.

Addition to S. J. Bowen School, located at Third and K Streets SW.: By the act of May 21, 1928, the appropriation of \$80,000 for a third-story addition to the Amidon School, contained in the District of Columbia appropriation act for the fiscal year 1927, was made available for the construction of a 4-room addition to the S. J. Bowen School. Contract was executed December 26, 1928, with Henry W. Cord, in the sum of \$61,097, for the construction of the 4-room addition, making alterations and installing mechanical equipment, heating, ventilating, plumbing, and electrical systems. The contract time will expire September 22, 1929. Obligations on the contract work to date are \$61,230. The gravity system of heating will be installed. Cubic contents, 158,000 cubic feet; cost per cubic foot, 38.6 cents.

Addition to the Francis Junior High School, located at Twenty-fourth and N Streets NW.: By the act of May 21, 1928, \$250,000 was appropriated for the construction of a 10-room addition to said school, including a gymnasium and lunch room and the necessary remodeling of the existing building. Contract was executed January 2, 1929, with the North-Eastern Construction Co., in the sum of \$150,750, for the construction of this building, as called for in the act of May 21, 1928, including alterations and the installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire September 9, 1929. Obligations on the contract work to date are \$150,740. The vacuum system of heating will be installed. Cubic contents, 562,046 cubic feet; cost per cubic foot, 26.8 cents.

Addition to Raymond School, located at Spring and Rock Creek Church Roads NW.: By the act of May 21, 1928, \$185,000 was appropriated for the construction of an 8-room addition, including a combination gymnasium and assembly hall and the necessary remodeling of the existing building. Contract was executed February 5, 1929, with the C. A. Hofferberth Construction Co., in the sum of \$167,259, for the construction of this building, as called for in the act of May 21, 1928, including alterations and installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire October 23, 1929. Obligations on the contract work to date are \$167,214. The gravity system of heating will be installed. Cubic contents, 460,000 cubic feet; cost per cubic foot, 35.7 cents.

Addition of gymnasium and assembly hall to Takoma School, located at Piney Branch Road and Dahlia Street NW.: By the act of May 21, 1928, \$60,000 was appropriated for the construction of a combination gymnasium and assembly hall at the Takoma School. Contract was executed February 5, 1929, with the C. A. Hofferberth Construction Co., in the sum of \$48,298, for the construction of said work, including necessary alterations and the installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time expires July 30, 1929. The work will be completed about September 15, 1929. Obligations on the contract work to date are \$47,220. The vacuum system of heating will be installed. Cubic contents, 171,666 cubic feet; cost per cubic foot, 31.9 cents.

Addition to the Morgan School, located on California Street between Champlain and Eighteenth Streets NW.: By the act of March 2, 1927, \$3,000 was appropriated for the preparation of plans and specifications for the construction of an 8-room addition, including a combination gymnasium and assembly hall and the necessary remodeling of the existing building. By the act of May 21, 1928, \$157,000 was appropriated for the construction of the above-described work. Bids for the construction work were received August 6, 1928, the lowest submitted being in amount \$172,490. As this bid exceeded the amount available, an order was issued rejecting all bids. Request was made on Congress for the appropriation of an additional amount, and by the act of February 25, 1929, not to exceed \$20,000 of the unexpended balance made available by the District of Columbia appropriation act for the fiscal year 1929 for the construction of a combined gymnasium and assembly hall for the Wheatley School was made available for the completion of the work on the Morgan School (amount of said balance, \$19,199.72). Bids were again received April 9, 1929, and contract was executed April 30, 1929, with George E. Wyne, in the sum of \$174,000, for the construction of this building, as called for in the act of May 21, 1928, including the installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. On account of emergency conditions which arose in connection with the foundation for the addition, which involved considerable extra work and expense, a transfer of \$15,000 of the funds appropriated for the construction of an 8-room addition to the Burrville School, by the act of May 21, 1928, was made and placed to the credit of the funds for the construction of the Morgan School for use in payment for extra work. The contract time will expire December 26, 1929. Obliga-

tions on the contract work to date are \$183,902.61. The vacuum system of heating will be installed in this addition. Cubic contents, 501,570 cubic feet; cost per cubic foot, 34.6 cents.

Ben W. Murch School, located at Thirty-sixth and Ellicott Streets NW.: By the act of May 21, 1928, \$175,000 was appropriated for the erection of an 8-room extensible building, including a combination gymnasium and assembly hall, on a site on Grant Road now owned by the District. By the act of February 25, 1929, not to exceed \$15,500 of the appropriation of \$375,000 for an addition to the Langley Junior High School, contained in the District of Columbia appropriation act for the fiscal year 1928, was reappropriated and made available as an additional sum for the erection of the building as above described. Contract was executed April 19, 1929, with the George Hyman Construction Co., in the sum of \$183,000, for the construction of this building, as called for in the act of May 21, 1928, including all approach work and the installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire December 15, 1929. Obligations on the contract work to date are \$183,000. The vacuum system of heating will be installed. Cubic contents, 598,000 cubic feet; cost per cubic foot, 30.6 cents.

Improvements to Western Market, located at Twenty-first and K Streets NW.: Contract was executed December 4, 1928, with Henry B. Davis, in the sum of \$9,100, for making alterations to the roof of the market. The work was completed February 1, 1929, at a cost of \$9,623.80. Contract was entered into June 4, 1929, with the Electrical Contracting Co., in the sum of \$3,455, for furnishing and installing electrical work and fixtures. The contract time for this work will expire September 2, 1929. Contract was executed June 11, 1929, with the Pyles Refrigeration Engineering Co., in the sum of \$9,500, for the construction and installation of refrigerating boxes. The contract time for this work will expire September 9, 1929. Contract was executed June 11, 1929, with the Stern Co., for furnishing and erecting six double butcher stands. The contract time for this work expires August 10, 1929.

Addition to Burrville School, located at Division Avenue and Hayes Place NE.: By the act of May 21, 1928, \$180,000 was appropriated for the construction of an 8-room addition, including a combination gymnasium and assembly hall and the necessary remodeling of the present building. Contract was executed April 2, 1929, with C. Harrison Smith Co., in the sum of \$139,263, for the construction of this building, as called for in the act of May 21, 1928, including alterations and installation of mechanical equipment, heating, ventilating, plumbing, and electrical work. The contract time will expire October 19, 1929. Obligations on the contract work to date are \$138,674.25. The vacuum system of heating will be installed. Cubic contents, 498,382 cubic feet; cost per cubic foot, 27.8 cents.

The grounds at the following list of school buildings have been improved under the sum of \$100,000 appropriated by Congress under the act of February 25, 1929:

Addison, Armstrong, Bancroft, Barnard, New Bell, Brightwood, Brookland, Brown, Bruce, Buchanan, Burroughs, Central, H. D. Cooke, Dennison, Eastern, Emery, Gage, Gales, Garnet-Patterson,

Gordon, Hayes, Health, Jackson, Janney, Keene, Langdon, MacFarland, Military Road, Miner Normal, Morgan, Oyster, Peabody, Petworth, Grant Road portable, portable located at Tenth and Franklin Streets NE., portable located at Twentieth and Rosedale Streets NE., Broad Branch Road portable located at Thirty-third and Northampton Streets NW., Randall, Reservoir, Slater, Smothers, Stanton, Stuart, Syphax, Truesdell, Washington, Webster, Western, Wheatley, Whittier, and Woodridge. A total amount of \$99,939.43 was expended at these schools.

Besides the preparation of plans and specifications for the above-mentioned buildings, plans and specifications for about 40 other items of work, such as alterations and repairs to buildings, heating installation, plumbing, and electrical work for the various buildings have been prepared in this office, the contract prices therefor amounting to \$292,480.95.

The contracts entered into by this office during the fiscal year beginning July 1, 1928, and ending June 30, 1929, amounted to \$2,785,822.32.

While it is too early to see very substantial results from the planted material, which has been installed under the \$100,000 appropriation for the improvement of school grounds, I feel sure that in a few years, when this material has filled out and the grass properly rooted, a very decided improvement will be manifest in the general appearance of the grounds surrounding our school buildings.

It is essential, however, that careful attention be paid to the maintenance of the planting around the schools in order that the work done may not be obliterated. Unsatisfactory maintenance work at many of the schools should be corrected by constant and adequate care. A notable exception is the Garnet-Patterson Junior High School, where the planting was completed late in the fall of 1928. The lawns and plants around this school are in excellent condition and have received a great deal of care and attention. The grass is the finest of any school in the city of Washington, and the janitorial force of this school deserves commendation for the manner in which they have cared for the grounds around this building.

Eastern High School, completed the latter part of 1922, is a good example of the value of good planting and careful attention. The lawns and gardens are always in fine condition and are a credit to the principal and to the janitorial force.

It is the hope of this office that the results of the improvement of the grounds around school buildings will make for better-looking school grounds and approaches.

ALBERT L. HARRIS,
Municipal Architect.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF REPAIRS

AUGUST 27, 1929.

SIR: I have the honor to submit herewith my annual report showing the operations of this shop during the fiscal year ended June 30, 1929.

There was appropriated by the act of May 21, 1928, for repairs and improvements to school buildings, repairing and renewing heating, plumbing, and ventilating apparatus, installation and repair of electric-lighting equipment, and installation of sanitary drinking fountains, and maintenance of motor trucks, including not to exceed \$1,500 for purchase of two dump trucks, \$529,610. All of this amount was expended during the year. Of this amount, \$60,000 was made available during the month of June, 1928.

The following comprises the extraordinary items paid for out of the school repair appropriation which were done by contract: Heating plants in seven schools, namely, Montgomery, Toner, Greenleaf, Twining, Maury, Hilton, and Ludlow, amounting to \$57,965; toilet facilities in four schools, namely, Edmonds, Banneker, Jefferson, and Webb, amounting to \$7,684; toilet facilities in Garfield School, amounting to \$7,684; iron gates at Buchanan School, amounting to \$248; repairs to thermostats in Shaw Junior High School, amounting to \$375; installation of cabinet doors in Oyster School, amounting to \$320; repairs to roof trusses in Central High School, amounting to \$835. These contract items give a total sum of \$74,577.

The act of May 21, 1928, appropriated \$25,000 for repairs and improvements to buildings and grounds of the fire department. All of this amount was expended except \$3.33.

The act of May 21, 1928, appropriated \$9,500 for repairs and improvements to police stations and station grounds. All of this amount was expended except \$191.52.

The act of May 21, 1928, appropriated \$2,500 for repairs and alterations to police court building. All of this amount was expended except \$73.37.

The foregoing amounts represent the actual cost of 6,884 separate jobs. In addition to the work covered by the above appropriations, which are under the supervision of the superintendent of repairs, this shop performed \$234,802.07 worth of work chargeable to various appropriations controlled by other departments. Of this amount, \$99,939.43 was expended for the improvement of public-school grounds.

The shop is comprised of 8 annual employees—superintendent, overseer, assistant superintendent, 4 clerks, and 1 watchman—and from 300 to 400 per diem employees of the various trades. The number increases and decreases according to the seasons of the year and the amount of work on hand.

Respectfully submitted.

HENRY STOREY,
Superintendent of Repairs.

To the MUNICIPAL ARCHITECT.

REPORT OF CONSTRUCTING ENGINEER, DISTRICT OF COLUMBIA WORKHOUSE AND REFORMATORY

LORTON, VA., *August 27, 1929.*

SIR: I have the honor to submit herewith my annual report of the construction and engineering work of the District of Columbia Workhouse and Reformatory at Lorton, Va., for the fiscal year ended June 30, 1929.

During the past year the various activities at these institutions were organized into five departments or divisions. The activities of the engineering division, comprising construction and maintenance of buildings and the operation of the institution utilities, are described as follows:

BUILDINGS—REFORMATORY

This group of buildings was occupied by the entire inmate population on completion of the new mess-hall equipment, November 19, 1928, and at the close of the fiscal year all of the buildings of this group were completed or under construction except the administration building and the school and hospital building.

During the year the following work was done: Remaining dormitories Nos. 4, 5, and 6, brickwork and roof completed except part of roof on dormitory No. 4; dormitories Nos. 7, 8, and 9, roofs completed, interior equipment installed, buildings painted and occupied, No. 9 being equipped for a temporary hospital; dormitories Nos. 10 and 11, painted and interior equipment completed for occupancy; completed incidental work on mess-hall equipment, including bread-storage room, proof room for bakery, painting, fly screens, hot-water supply, etc.; shower baths, water heater, and other interior equipment installed in bathhouse No. 16; foundation placed and 85 per cent of brickwork and 90 per cent of structural steel for roof placed on assembly-hall building No. 2.

Beginning late in March, 1929, work was started on buildings Nos. 24, 25, and 26, funds for this work having been made available by a special appropriation. Building No. 26 to be used as an office for the disciplinary officer and for the observation of prisoners was completed, except for the interior equipment and painting. Foundations were placed and brickwork carried sill high on buildings Nos. 24 and 25. Work could not be carried above this level, as special steel window grilles could not be obtained through the regular procurement system before the end of the fiscal year.

The status of the permanent buildings at the reformatory on June 30 was as follows:

Completed and in service: Nine dormitories, 2 disciplinary dormitories, 5 shops, 1 mess hall, 1 bathhouse, and 1 boiler house.

Under construction, average 75 per cent complete: Three dormitories, 1 assembly hall, 2 disciplinary dormitories, and 1 office and disciplinary building.

In addition to building operations, an athletic field with permanent seats was developed by filling in a ravine on north side of buildings. Repairs were made to all buildings where necessary. The main dormitory and mess-hall building of the temporary group was converted into offices, sleeping quarters for employees, and part of same used for industrial purposes. A 5-room cottage on the tract of land recently purchased near stables was remodeled, providing sleeping quarters for officers.

BUILDINGS—WORKHOUSE

Under normal conditions the entire inmate population can be housed in permanent dormitories, but temporary buildings are still in service for employees' quarters, dining room, and hospital as a

reserve to prevent overcrowding. As the permanent buildings are being constructed on the same general location as the temporary buildings, the clearing of the sites for new buildings and providing necessary facilities for taking care of the institution requirements necessitated considerable extra work and to some extent retarded the progress on new buildings.

The following work was done during the year:

Building No. 1: Work was started on the foundation of mess hall. In order to clear the site for the construction of this building it was necessary to equip one of the old temporary dormitories as a mess hall, to be used until the permanent mess hall is completed, as the permanent mess hall is to be built on the same site as the old.

Building No. 2: Cells and interior work completed and made ready for occupancy.

Building No. 9 (under construction last year): Roof completed and building equipped with facilities for bathing inmates and for the storage, repair, and laundering of clothing.

Building No. 10: Brickwork carried sill high in rear section. Old rest hall projecting over front site prevented further progress.

Building No. 11: Constructed throughout and was equipped for use as a recreation hall temporarily. This building was partially ready to occupy except for the installation of moving-picture machine at close of year.

Permanent sewers were installed to serve the new buildings and 80 per cent of the steam tunnels completed. Repairs were made to all buildings where necessary. Some old temporary buildings were torn down.

The status of permanent buildings at the workhouse on June 30 was as follows:

Completed and in service: 6 dormitory buildings and 1 disciplinary dormitory, with 38 cells and office for disciplinary officer.

Under construction: One dormitory and one mess hall.

RAILROAD

The 45-ton steam locomotive was completely overhauled by the Newport News Shipbuilding & Dry Dock Co. and returned to the penal institutions on September 27, 1928. The usual maintenance work was done on the track and a new spur completed in part to the boiler house at the reformatory. A permanent stone crusher driven by gasoline engine was installed at the brick plant so that all scrap and waste brick can be crushed for railroad ballast. Due to the necessity for conserving growing timber on the reservation, part of the railroad ties were bought this year.

NEW CONSTRUCTION AT BRICK PLANT

At the plant the following work was done: Two new kilns with stack were constructed. Two new kilns were constructed on foundations of old kilns, using stacks and ducts of old kilns. Work was started late in June on tearing down one of the two additional kilns to be rebuilt and materials were obtained for their construction.

When estimates were prepared in 1927 for reconditioning brick kilns, it was considered at that time that new crowns could be placed

on some of the old kilns without tearing down the side walls. These kilns had deteriorated so rapidly in the past two years, however, that it was found necessary to tear down those kilns which were to be rebuilt to a level below the ground line and construct new kilns throughout on the old foundations. This extra amount of work required considerably more time and material than estimated.

The cost of these kilns averaged about \$4,500 for new kilns with stack and \$3,500 for kilns rebuilt on old foundations. The use of fire-brick seconds materially reduced the cost of the last kilns constructed. One hundred new drier cars were obtained, together with a number of flat cars and other equipment, for handling bricks. Repairs were made to old kilns and stacks.

A complete new pyrometer system was installed for indicating and recording the temperature of various brick kilns. In this system all pyrometer extensions are underground. A new lighting system was installed in part around brick kilns. Repairs were made to buildings, including roof of drier shed. Specifications were prepared and contract let for the installation of an electric vibrating screen for screening clay.

WHARVES, BARGES, ETC.

A new timber wharf approximately 220 feet long was constructed near Ninth and Water Streets SW., Washington, D. C., under the supervision of the District of Columbia bridge department, for penal institutions.

A section of concrete wharf approximately 150 feet long was completed, being a part of a 300-foot section under construction on Occoquan Creek, near brick plant.

The following work was done on barges at the shipyard: Treated southern pine timber was purchased for the construction of four barges, two of which were completed and the third was under construction during June. One house boat was constructed for handling general supplies. Two barges, transferred from sewer department, were reconditioned and put in service. Two barges were constructed entirely of treated timber; they were launched April 3 and May 29, 1929.

At the end of the year the following barges and boats were in service: 1 house boat, capacity 90 tons; 2 reconditioned barges, capacity 180 tons; 1 sand barge, built in 1927, capacity 195 tons; 2 new barges, capacity 390 tons; 1 old barge, capacity 90 tons; 1 sand dredge; and 1 tugboat.

WATER SYSTEM

A new steel water-storage tank of 100,000 gallons' capacity was constructed under contract by the Youngstown Boiler & Tank Co., Youngstown, Ohio, at the District of Columbia reformatory. Work was started May 6, 1929, and completed June 18, 1929. A connecting pipe was installed with fire-hydrant connections. This tank provides sufficient storage capacity so that the pumps do not need to be run during the time the industrial plants are in operation. It also insures better fire protection and provides a reserve supply of water at the reformatory should the feed main break. Some studies were

made and preliminary estimates were prepared for other improvements to the water supply. As the population of the institutions is increasing rapidly, improvement to the water system should be made without delay.

POWER AND HEATING PLANTS

Preliminary studies were made for the establishment of a combined heating and electric power plant at the workhouse, as demand for electric power will necessitate some expansion of the plant in the near future.

As the engineering activities are rapidly increasing each year, necessitating more and more detailed work and supervision, it is earnestly requested that sufficient trained help be provided to safeguard satisfactory development of these projects and that the same consideration be given to pay of employees engaged on this work as afforded others on similar work in the District government.

Respectfully submitted.

HERBERT R. HAAR.

Constructing Engineer.

To the MUNICIPAL ARCHITECT.

REPORT OF THE ASSISTANT SUPERINTENDENT OF THE DISTRICT BUILDING

AUGUST 20, 1929.

SIR: I herewith submit, for the fiscal year ended June 30, 1929, my report on the maintenance and care of the District Building, which embraced the power plant, woodwork and paint shop, electrical section, blue-print and photograph shop, the watch force, cleaning force, laboring force, and the elevator force.

There were purchased and installed 36 door interlocks, 1 at each landing of each passenger elevator. Minor repairs were made to the elevators at a total cost of \$423.50. Two hand-drying machines were purchased and were placed in two of the lavatories. As the result of their use the saving in paper towels has more than paid for the dryers. The ceiling and walls of 118 rooms were washed. The roof of the District Building is in need of repair. In our estimates for the fiscal year 1931 we asked for \$10,000 for this purpose, and it is earnestly requested that Congress be urged to appropriate this amount, which I estimate will be sufficient.

POWER PLANT

There were consumed 2,323 tons of coal, purchased at an average cost of \$5.29126 per ton, which ranged from 10.4 per cent to 16 per cent ash. There were 535 $\frac{1}{3}$ cubic yards of ashes removed at \$0.34 per cubic yard. Repairs were made as follows: Boilers and furnaces, \$634.54; refrigerating system, \$29.05; heating and ventilating system, \$9.75; plumbing, \$49.83; and miscellaneous repairs, \$55. One new pump was purchased and installed at a cost of \$200, and 13,972 pounds of grate bars at total cost of \$475.79. The total number of kilowatt-hours generated was 778,565, which was used as follows:

Elevators, 50,580 kilowatt-hours; lighting, 605,370 kilowatt-hours; and miscellaneous motors, 122,615 kilowatt-hours. The pneumatic-tube system was in operation 3,522 hours, the heating system 5,124 hours, and the ventilating system 1,249 hours.

WOODWORK AND PAINT SHOP

Repairs throughout the building were made by this department. These repairs included repairs to doors, door locks, door checks, Venetian blinds, transoms, gates, railings, furniture, and replacement of window glass. Partitions were moved, gates and pneumatic tube boxes made, and strips were placed at windows on the fourth floor. The doors and panels at the east entrance of the building were refinished at a cost of \$298.94. A partition was built for the purchasing office at a cost of \$294.19 and three for the Board of Public Welfare at a cost of \$188.52; one built in the first-floor corridor and one in the fourth-floor corridor. Walls and ceilings were painted. The fifth-floor corridor was plastered and painted at a total cost of \$81.20. Miscellaneous jobs, for which no charge was made, representing in labor and material \$4,481.53, were completed by this department.

ELECTRICAL SECTION

Replacements were made by this section as follows: On the elevator equipment there were replaced 300 arc arrestors, 8 cork-lined brake shoes, 30 main contacts, 36 special main contacts, 20 double and 24 single copper plates, and 30 special plates. Miscellaneous replacements were made throughout the building, such as lamps, fuses, plugs, lamp and adding-machine cord. Minor repairs were made to adding machines, electric fans, and motors for the various departments. A new switch and the necessary new cable were installed for use in connection with an air compressor in the subbasement.

BLUE-PRINT AND PHOTOGRAPH SHOP

There were 205,881 square feet of blue printing completed by this department for the various departments of the District Government at a cost of \$5,184.06, and photographs, photostats, and mounting maps totaling \$369.88.

E. P. BROOKE,

Assistant Superintendent, District Building.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT, MUNICIPAL GARAGE

AUGUST 8, 1929.

SIR: I have the honor to submit the following report on the municipal garage for the fiscal year ended June 30, 1929.

This garage was kept open night and day at all times for urgent and necessary transportation.

There were 56 automobiles maintained and kept in running order for the various departments of the District government, as follows:

Executive office.....	3	Highways department.....	2
Building inspector's office.....	2	Playgrounds.....	1
Plumbing inspector.....	1	Electrical department.....	7
Assessor's office.....	5	Community centers.....	1
Corporation counsel.....	1	Health department.....	2
Municipal garage.....	9	Board of public welfare.....	3
Director of traffic.....	2	City refuse division.....	3
Municipal architect.....	2	Public utilities.....	1
Surveyor.....	5	Weights and measures.....	6

The duties of our labor and mechanical force were repairing automobiles, driving for departments without drivers, carrying mail from the city post office to the District Building, oiling, greasing, gassing, taking speedometer readings daily, washing cars at night, and also acting as watchmen. We have an automobile repair shop and paint shop at Second and Bryant Streets NW., where all repair work and painting is done for the water department, sewer department, District of Columbia repair shop, board of public welfare, trees and parkings department, police department, and others.

The garage at present is very much overcrowded, and our only relief from this condition is that about 30 per cent of the 56 cars are kept out of the garage at night. It would be impossible to store all of these machines in the garage at one time, as this building was constructed to house 25 cars, with sufficient floor space to allow for washing and repairing.

Operating cost for the maintenance of 56 automobiles, including labor, gasoline, oil, grease, tires and tubes, miscellaneous supplies, and drivers amounted to \$21,899.82, or an average of \$391.06 for each car, or \$0.0406 per mile, a saving over last year of \$18.28 on each car, or \$0.0003 per mile.

The cost of repair parts used in the cars was \$3,074.95, or an average of \$54.91 for each car, or \$0.0123 per mile, a saving over last year of \$12.09 per car, or \$0.0003 per mile. Mileage of the 56 automobiles totaled 356,276 miles, or 6,362 miles per car.

This office during last year reissued license plates for all passenger cars and trucks owned by the District government, and a record of each automobile and truck was kept; also, 31 old worn-out passenger cars were exchanged for new ones and 3 additional cars purchased for the various departments of the District government.

C. N. EMMONS,

Superintendent Municipal Garage.

To the ASSISTANT SUPERINTENDENT DISTRICT BUILDING.

SEPTEMBER 1, 1929.

SIR: I have the honor to submit herewith the annual reports of the coordinator and chief engineer, the engineer of highways, the permit clerk, the surveyor, the superintendent of trees and parkings, the sanitary engineer, and the acting superintendent of the water department for the fiscal year ended June 30, 1929.

Respectfully,

HUGH P. ORAM,

Captain, Corps of Engineers, United States Army,
Assistant.

To the ENGINEER COMMISSIONER.

REPORT OF THE COORDINATOR AND CHIEF ENGINEER

SIR: There is forwarded herewith the report of the engineer of highways for the fiscal year ended June 30, 1929.

The report briefly outlines the construction, maintenance, and other operating accomplishments of the highway department for the year.

Upon completion of the construction season early in December the engineering and inspection personnel were utilized in a survey of highway conditions, revision of all specifications, and preparatory work for the working season of 1929.

The many separate specifications of the department covering all phases of its work were entirely rewritten and assembled in a single volume of standard pavement specifications. The past practice of fixing prices in connection with miscellaneous work involved in street improvements was discontinued and bids solicited on all items entering into the construction.

The survey undertaken during the year to ascertain the condition of all improved streets and roads was only partially completed, the work being discontinued in order to allow sufficient time, with a limited engineering personnel, for the proper preparation for the construction season. It is planned to entirely complete this report during the winter months, enlarging the scope of the work to include all streets and roads of the District. The report as thus far compiled indicates the necessity for continuing the replacement policy upon a systematic basis of pavements of other than modern design and past the useful age for traffic of the weight and volume of to-day. It is proposed also to include in this report detailed information for the improvement of main thoroughfares. While considerable progress has been made in highway improvement to meet the rapidly increasing demands of traffic, it is not believed the main thoroughfare development has kept pace with the local street improvement. The necessity for the improvement of all main roads not fully developed leading to neighboring States and the development of parallel highways to our main arteries to relieve traffic congestion is essential and becoming more urgent daily as the volume of traffic increases. Development of such thoroughfares is often retarded due to lack of public ownership, so that in the study being made will be included a report of ownership conditions with recommendations for acquiring the additional right of way believed desirable.

During the latter part of the fiscal year the maintenance division has undertaken experiments in connection with low-cost road development for the purpose of providing a more suitable roadway surface for sections not sufficiently improved to warrant permanent pavements. This work will be continued with the hope of reaching satisfactory conclusions for handling this phase of the maintenance problem.

The appointment during the fiscal year of a cost accountant has made possible the installation of a cost record system enabling the department to gain an insight into the costs of various operating methods that should in time prove extremely beneficial and be the means of effecting further economies of operation. The department's appropriations have largely been consolidated under three or four

items, which required an allocation of funds for the various activities in the several divisions. This has been accomplished by the setting up of a department budget for the coming fiscal year.

RECOMMENDATIONS

The following matters are recommended for consideration:

1. The adoption of a more or less definite plan and program for the widening of congested streets and thoroughfares. It is only through such a plan that the department is able to be properly guided in the replacement of worn-out roadway pavements to insure against the fatal mistake of having to remove comparatively new paving in the future for such purposes.

2. The appointment of a board to make a thorough study of assessments as applied to roadway paving with a view to recommending revision to existing laws to meet present-day conditions.

3. The official adoption of the tentative 5-year bridge-replacement program, with minor modifications, as outlined in the 5-year financial program of the auditor. Many bridges of the District are totally inadequate for the traffic weights allowable and necessary for modern traffic, while others are highly congested, due to the volume of traffic. A progressive program looking to the elimination of important grade crossings as authorized under existing law should, it is believed, be formulated at an early date.

4. Attention is invited to the desirability of securing authority for the prequalification of bidders as to experience, equipment, and financial responsibility or the authority to disqualify a low bidder if he can not show the proper experience, does not control adequate and modern equipment, or possess sufficient financial responsibility to perform the work. It has been the unfortunate experience of the department (in having to accept any low bidder who could furnish bond as the contractor) in one or two instances to have incompetent contractors on some of its larger work. District engineers and inspectors can enforce most of the provisions of the specifications; however, they can not provide organization to insure consistent execution, nor can they provide the spirit and equipment for high-class work.

5. The necessity for a traffic survey within the District of Columbia and of the main roads leading to the District becomes more vital to the highway department every day. The director of traffic on several occasions has recommended traffic counts, and while such counts would assist the highway department, a complete traffic analysis is believed necessary and desirable. It is urged that authority and funds for this purpose be secured.

6. The traffic regulations of the District as applied to truck weights and design are, in my opinion, in need of revision to meet types of vehicles now common and in everyday use as well as to exclude those of improper design. The study to consider such revision should also include the advisability of annual inspection of solid-tire vehicles and limitations of their operation.

7. Closer coordination between existing agencies dealing with the street and its uses is not only desirable but essential if the full value and benefit to be derived is to result to the public. The highway department is and should be responsible for providing and maintaining adequate highways in the District, the director of traffic for all

regulations governing the uses of the highways, the police department for the enforcement of the regulations, and the Public Utilities Commission for the routing, stops, etc., of public carriers. In order to obtain the full use and benefit from what is provided and to plan an increase and betterment in such facilities, these departments must work in close liaison or one will undo the works of the other or one will fail, even within the limits of its ability, to provide what the others need. Specific instances can be recited to show the necessity for a closer coordination of these activities. Independent functioning can only result in retarding traffic flow and capacity to such an extent as to eventually require additional and wider roadways. While street widening is necessary and urgent in many cases, this method should be resorted to only when a full utilization of existing facilities have been reached. The vehicular capacity of city streets may be measured largely by the number of vehicles capable of passing through the intersections, yet it has been the practice of cities to almost entirely concentrate at or near intersections such utilities and accessories as loading platforms and zones, hack stands, bus stops, etc., resulting in a greater congestion and slowing up of traffic than if these necessary utilities were planned as a whole rather than by individual groups, resulting often in concentration at the same general location. Six lane streets (three in each direction) are frequently throttled down to two lanes (one in each direction), retarding the free movement of traffic flow by the prevailing or customary street use or layout.

I am deeply indebted to the employees of the highway department for their loyalty and cooperation during the year.

H. C. WHITEHURST,
*Coordinator and Chief Engineer,
Engineer Department, District of Columbia.*

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE ENGINEER OF HIGHWAYS

SEPTEMBER 11, 1929.

SIR: I submit the following report of the operations of the office of the engineer of highways for the fiscal year ended June 30, 1929.

The total funds appropriated and deposited for the work of this department for the past year aggregated \$4,485,124.81 of which \$552,164.81 was spent in repairing pavements disturbed by other branches of the District government and by various corporations and others.

Summary of work under appropriation for improvement and repairs for year ended June 30, 1929

Cement gutter-----	square yards--	17, 228
Miscellaneous pavements-----	do-----	114, 598
Standard asphalt pavement-----	do-----	136, 022
Standard asphalt surface-----	do-----	140, 068
Vitrified block gutter-----	do-----	840
Cement concrete roadway pavements-----	do-----	¹ 330, 995
Old cobble and block removed-----	do-----	475

¹ 62,332 square yards concrete laid under whole-cost system.

Granite and bluestone curb set-----	linear feet--	16, 770
Cement curb formed and laid-----	do-----	157, 666
Grading-----	cubic yards--	250, 590
Cement concrete sidewalks (assessment and permit work)	square yards--	23, 533. 69
Cement concrete sidewalks (around Government reservations)	square yards--	3, 872
Cement concrete alleys (assessment and permit work)-----	do-----	² 70, 396. 54

The following is a list of tables appended to the report:

- Table A. Street railways in the District of Columbia, July 1, 1929.
- Tables B and C. Statement of character and extent of street pavements.
- Table E. Street improvements.
- Table F. Repairs to asphalt and coal-tar pavements.
- Table G. Work done for street-railway companies.
- Table H. Work done by day labor under appropriation for "Repairs to streets, avenues, and alleys."
- Table I. Regular permit work.
- Table K. Assessment work.
- Table L. Replacing and repairing sidewalks and curbs around public reservations.
- Table N. Whole cost work.
- Table O. Repairs to cuts by plumbers and others.
- Table P. Grading streets, alleys, and roads.

Of the above tables, B and C are printed herewith. The remaining tables are on file in the record room of the office of the engineer of highways, plan case No. B-1346.

The year's construction program comprised 232 work items, consisting of 5.68 miles of resurfacing work of 32 items; 0.96 miles of roadway widening work of 6 items; 1.16 miles of covering work of 7 items; 6.71 miles of asphalt heater work, containing 45 items; 6 miles of bituminous concrete, the most of which was done in conjunction with the curb and gutter work, consisted of 17 items; 14 miles of cement concrete work of 100 items, 9 of which were laid under the permit or one-half cost deposit system. Twenty-five items of contract grading were executed during the working season. Five miles of concrete roadways, consisting of 50 items was done by the whole cost method (that is, work paid for entirely by individuals or corporations), the majority of the roadways being 10-foot strips. There was also laid at whole cost of property owner 2.6 miles of concrete alleys, consisting of 26 items.

The average age of the asphalt pavements renewed this year was 29.4 years, and the cost of repairing the old asphalt pavements not covered by the 5-year guaranty was 0.048 cent per square yard.

The following are abstracts from reports in detail made by heads of divisions or sections of the year's activities and accomplishments, changes instituted and contemplated, and recommendations. The reports themselves are filed in this office, with the tables appended to this report, for study and reference and for development of the processes recommended therein.

MAINTENANCE

Superintendent of suburban roads.—The material and mixing yard at Second and N Streets NE. manufactured 16,131 tons of bituminous concrete for cold patching. For the production of this product and for other surface work of maintenance there was received at this yard a total of 58 carloads of bituminous material and 610 carloads of broken stone.

² 22,833 square yards cement alley laid under whole-cost system.

Fifteen gangs, averaging 8 to 10 men were engaged on the maintenance of suburban roads and streets, and an additional seasonal force of about 25 men broke and spread on unimproved streets old pavement materials received from street-paving contractors.

The length of surface-treated bituminous roads under maintenance was 153 miles, averaging 30 feet in width, on which was placed about 300,000 square yards of mixed bituminous surfacing and about 5,000 tons of dry stone and 74,300 gallons of bituminous cement on large repairs.

About 13 miles of gravel roadways were maintained with like material, while about 180 miles of otherwise unimproved roadways were the field of upkeep with cinders or old street pavement material. Cinders used amounted to 11,000 cubic yards. New streets surfaced with old street material aggregated 13.3 miles.

Macadam roadways were surface treated with bitumen and covered with chips or gravel to an aggregate of 613,307 square yards at an average cost of \$0.086 per square yard.

In the prevention of dust and under an allotment of funds therefor from the appropriation for street cleaning, 100,000 gallons of light asphaltic oil was applied and 100 tons of calcium chloride was spread on cinder and old-material roadways.

A contract for the supplying of prepared cold patch material was made in the latter part of the year. This will result in a product of greater cohesive quality than heretofore used.

The preparation of macadam roadways for bituminous surfacing under the large current program of curb and gutter installations has been placed under contract instead of being attempted by our own day labor forces; resulting in a definitely less diversity of responsibility, a simplification of operating organization on the street and a material economy in costs. Recommendations for changes in organization of the supervisory force are submitted.

Superintendent of streets and cuts.—Early in the fiscal year the duties of superintendent of cuts were tentatively assumed by the superintendent of streets. At the same time the performance of the work of repairs to cuts was placed under contracts therefor and the large day labor force previously maintained for this activity was eliminated. These contracts were specifically for placing concrete base in cuts, repairing asphalt roadways, repairing cement concrete roadways and alleys, and repairing cement sidewalks. The organization for repairs to cuts was maintained as a separate one in all other respects; with segregated personnel and material and strict allocation of all its financial processes to its proper audit head, operating account (streets).

Surface repairs to cuts in macadam, vitrified block, asphalt block, and granite-block roadways, and in brick sidewalks are executed by the day labor forces of the highway department at the cost of the appropriation "Operating account (streets)."

The repairing of sheet asphalt pavements under contract, at prices that were economically advantageous, in comparison with previous day-labor costs, cost \$98,209.28. Under the same process the surface repairs to cuts made in this type of roadways cost \$56,303.59. In maintenance of joint filler 1,476,715 square yards of concrete roadway and alley pavement were treated at a cost of \$11,322.79, or about three-quarters of a cent per square yard. The entire area of this type of pavement within the District received at least one treatment.

Truckmaster, highway department.—The shops and garage maintained, repaired, and serviced nearly 100 District owned motor vehicles, passenger-carrying and trucks, and all equipment and tools of the maintenance division, including motor rollers, concrete mixers, asphalt trucks, road graders, loading machines, conveyors, sprinkling and oil wagons, and other like equipment and tools, with a personnel of about 115 laborers, mechanics, drivers, and supervisors. A second or night shift for repairs to equipment was organized; a scheduled truck delivery service of supplies, including gasoline and oil, to the working gangs in the field was developed; an inventory of all supplies and materials under the charge of the garage and shops was made and a stock card system set up; and the hiring of trucks supplementary to those owned by the District was placed under a service contract instead of the former system of hiring the individual units. All the above changes were distinctly advantageous and resulted in much direct and indirect economy.

A trailer truck for efficient transportation of road rollers and like heavy equipment is under construction, which will expedite the movement and save wear and tear on the equipment transported.

The authorized removal of this unit to a new site at Second and Bryant Streets will afford opportunity for more efficient conduct of its activities.

CHIEF INSPECTOR

With an organization of 41 inspectors and 34 material checkers a marked improvement in the supervisory control of all construction processes resulted from increases in the number of inspectors and in their individual efficiency as well as from the use of standard specifications for all of our types of material and construction. Also a marked betterment is reported as a result of the coordination now applied to all our own operations and to those of other branches of the District service and of public-service corporations and individuals that affect the execution of our construction programs.

Truck-mixed concrete had a limited application in the year's work and promises improved results with experience.

Concrete finishing and curing were continuously bettered in methods selected and in their application. Barricades and detour signs were more systematically placed and maintained; and many field and office details were improved. The practice followed by one contractor for concrete roadways of paving and curing successive individual longitudinal strips of about 15 feet width is suggested for a future specification requirement. Detail betterments in specifications and the management of their application and in engineering control are presented.

INSPECTOR OF ASPHALTS AND CEMENTS

Tests of 2,860 samples were made, including chemical and physical tests of asphalt cements, asphalt mixtures, limestone dust, gravel, road oils, sands, binder and macadam stone, and tar, and tests on cement concrete cores and beams. Inspection was maintained at the plants of all contractors for street paving and repair; and at all Portland cement warehouses issuing this material for such processes. Core-drill samples of concrete roadway and alley pavements and of concrete bases were systematically made, and laterally concrete-beam tests were also made.

The utilization of concrete-beam tests for determining the proper curing period of the roadway slab promises almost certainly great advantages to the public in shortening to a scientifically established minimum period the necessary curing time of each roadway slab, thus permitting the opening of the thoroughfare to traffic at the earliest justifiable date.

Recommendation is made for additional transportation facilities and laboratory equipment.

ENGINEER OF BRIDGES

The reflooring of the Chain Bridge, Pierce Mill Bridge, and Twentieth Street Bridge over Piney Branch and the repairing of Wharf No. 6 were completed and the painting of Calvert Street Bridge was practically completed.

The reconstruction of the Virginia abutment of the Chain Bridge was completed.

Bridges across Stickfoot Branch at Field Street and Stanton Road were completed.

The reconstruction of the bridge across Rock Creek at Military Road, the reconstruction of the floor of the Highway Bridge across the Potomac River, and the reconstruction of the morgue wharf were completed.

Contract was executed and work commenced on the reconstruction of the M Street Bridge over Rock Creek.

The bridge structures under the control of the commissioners throughout the District were continuously inspected and repaired as necessity developed. In the office, studies and estimates have been developed for grade-crossing elimination structures at Michigan Avenue and Chestnut Street; investigations, estimates, and recommendations have been made as to repairs to bridge structures of the Washington Railway & Electric Co., the Chesapeake & Ohio Canal Co., the Baltimore & Ohio Railroad Co., and the Washington Terminal Co.

Personnel reclassification changes are reported and personnel reorganization recommended involving additions thereto and increases in compensation of stated positions.

My acknowledgments are due to the employees of this department for the work accomplished by the office during the year.

C. B. HUNT,
Engineer of Highways.

To the COORDINATOR AND CHIEF ENGINEER.

TABLES B AND C.—Character and extent of roadway pavements, June 30, 1929

	Square yards	Mile- age		Square yards	Mile- age
Asphalt.....	3,582,511	191.19	Cobble.....	36,374	1.52
Asphaltic surface.....	301,777	18.68	Macadam (estimated).....	1,364,783	94.66
Asphalt block.....	481,323	24.37	Gutters on asphalt streets.....	257,769	-----
Asphaltic concrete (concrete base).....	76,302	4.28	Gutters on asphaltic concrete streets.....	9,723	-----
Asphaltic concrete (stone base).....	38,909	2.16	Pavements maintained by street railroads.....	616,807	-----
Miscellaneous pavements.....	1,120,529	17.29	Gravel and unimproved streets (estimated).....	-----	182.53
Cement concrete.....	1,500,167	81.67	Total.....	8,668,178	623.85
Durax block (small granite block).....	31,679	1.13			
Granite and rubble.....	232,135	13.33			
Vitrified block.....	17,390	1.04			

107,339 square yards asphaltic concrete (concrete, granite block, and macadam base).....	Mile
13,190 square yards asphaltic covering (concrete and granite block base).....	6.61
120,529	7.29

REPORT OF THE PERMIT CLERK, ENGINEER DEPARTMENT

AUGUST 12, 1929.

SIR: The operations of the permit clerk's office, giving the number of permits issued during the fiscal year ended June 30, 1929, is hereby submitted:

Water connections.....	1,970
Repairs.....	903
Specials (no fees).....	129
Sewer connections.....	2,037
Repairs.....	552
Specials (no fees).....	528
Gas connections.....	1,900
Repairs.....	523
Mains, lay and repair.....	428
Specials (no fees).....	241
Electric connections and underground construction.....	2,841
Repairs.....	23
Conduits, lay and repair.....	725
Manholes, build and connect with sewers.....	431
Specials (no fees).....	149
Air pipe lines, lay.....	1
Fences and hedges to inclose parkings.....	288
Guard stones, place in alleys.....	8
Parkings, pave.....	74
Poles, erect, replace, and remove, telegraph and telephone.....	1,311
Tanks, install for fuel-oil heating.....	194
Walls, erect retaining on parkings.....	456
Miscellaneous.....	4
Total.....	15,716
Permits for various work in public space.....	5,796

21,512

Fees amounting to \$14,669 were paid for 14,669 permits; permits for which no fees were charged, 5,796.

Record cards were made of all files referred to this office, permits issued, or reports made and files returned to the divisions having:

supervision of inspections of work for which the permits were issued.

All applications were filed according to location, and report of excavations in public space made for necessary repairs.

H. M. WOODWARD,
Permit Clerk.

To the COORDINATOR AND CHIEF ENGINEER.

REPORT OF THE SURVEYOR

AUGUST 30, 1929.

SIR: I have to submit herewith annual report covering the activities of the surveyor's office of the District of Columbia for the fiscal year ended June 30, 1929.

This office is operated as two branches, namely (1), main office (office in charge of surveys, subdivisions, records, etc.), and (2) street extension division (street extensions and changes in the highway plan).

The work of the surveyor's office is listed under three classes: (1) Work performed for private parties for which fees are charged as prescribed by order of the commissioners; (2) work for the various departments of the District and Federal Governments for which no fees are charged; (3) work done in connection with condemnation cases for streets, alleys, parks, school and playground sites, etc.

Following is a statement showing in detail work performed under these three classes for the past year:

1. WORK FOR PRIVATE PARTIES

SURVEYS

Number of surveys made, 1,776.

Number of individual lots staked on orders for surveys, 3,131.

Certificates (or plats) of survey issued, 1,776.

Surveys to locate foundations of buildings in course of erection, 1,352.

Number of buildings located with relation to property lines, 509.

Large tracts surveyed, subdivided, and recorded, 9.

Surveys made of unsubdivided tracts, 97.

SUBDIVISIONS

Subdivision plats prepared (in duplicate), 357.

Subdivisions recorded, 253.

Total number of lots in subdivisions recorded, 2,101.

PLATS ISSUED IN CONNECTION WITH PERMITS

Plats made to accompany applications for building permits (commonly called "building plats"), 3,653.

Plats made under regulations covering zoning law, for the erection of garages, motors, etc., 475.

MISCELLANEOUS PLATS

Plats of all kinds made up on order of private parties, 6,325.
Highway maps of the District of Columbia sold, 357.

ESTIMATES ISSUED AND FEES COLLECTED

Estimates of cost (issued in triplicate), 8,319.
Total of fees paid to collector of taxes, District of Columbia, for work done by the surveyor's office, \$40,014.45.

2. WORK FOR THE DISTRICT OF COLUMBIA AND FEDERAL GOVERNMENTS

Number of surveys made, 115.
Plats recorded (condemnations, dedications, etc.), 86.
Plats showing readjustment of alleys (opening and closing alleys), 20.
Plats recorded showing changes in the highway plan, 11.
Reports to building inspector concerning foundation walls in course of erections, 1,352.
Assessment and taxation plats recorded, 201.

3. CONDEMNATION CASES

Cases pending in court, 45.
Cases confirmed by court, 5.
Cases ordered by commissioners but not yet filed, 5.
Total amount awarded as damages in condemnation cases, \$14,814.24.
Total amount assessed as benefits in condemnation cases, \$17,205.76.
Total costs of court proceedings, \$2,390.90.

SUMMARY OF WORK FOR THE DISTRICT OF COLUMBIA

Total number of surveys made for the District of Columbia and private parties, 3,349.

Total of plats, public and private, including plats drawn in books, 8,607.

Total number of land descriptions written, 639.

A table showing a comparison of the work performed by this office during the past fiscal year and the year previous is on file in this office.

SURVEY WORK

The amount of survey work performed during the past year for private parties has exceeded that done during the year previous.

In this class of work surveys were made in connection with many important private projects, among which were survey to mark corners of Miller Bros' subdivision of Spring Valley, survey of Sears, Roebuck & Co. property at Maryland Avenue and Bladensburg Road, survey to set corners of various parcels, including parcels 46/80, 46/128, 207/8, 91/26, 91/28, 184/8, 178/6, 96/2, 18/39, 18/64,

18/65, and 147/46, survey of the Georgetown College property, and a number of locations of large apartments and business properties.

In addition, there has been a great amount of work done for the District and Federal Governments in connection with important projects carried out or now under consideration.

Surveys made in connection with this important work included survey for the enlargement of the Capitol Grounds, survey of the District Training School near Laurel, Md., survey of street lines in the Oxen Run Valley for the sewer department, survey of Canal Road for the highway department and property bordering on the Canal Road, survey in connection with the relocation and straightening of Michigan Avenue and the location of houses on Blair Road between Dahlia Street and the District line. Surveys and computations have also been made and plats furnished in connection with the important building projects of the Government in the triangle south of Pennsylvania Avenue.

SUBDIVISIONS

There has been an increase in the amount of subdivision work during the past year over that of the previous year. More subdivisions have been recorded and many more new lots created. This has resulted in a greatly increased volume of work for the office, as all block corners of the new subdivisions are marked with monuments on the ground and computations of lines and areas for all lots must be made.

On account of drainage and grade matters and the zoning regulations, it is necessary to make a thorough study of all plans of proposed subdivisions, and the most careful cooperation between the various departments of the District is essential before final approval and recording of any subdivisions submitted for record.

STREET EXTENSIONS

Following is a list of streets acquired by condemnation or dedication and placed on the record books during the past year:

Twenty-ninth Street south of Upton Street NW.

Extension of U Street between Thirty-fifth Street and Thirty-seventh Place NW.

Widening of Benning Road east of Oklahoma Avenue NE.

Sterrett Place between Reno Road and Idaho Avenue NW.

Van Ness Street east of Connecticut Avenue NW.

Southern Avenue southwest of Benning Road SE.

Benning Road northeast of Southern Avenue SE.

Hillside Road west of Benning Road SE.

Elder Street west of Seventh Street NW.

Devonshire Place west of Cortland Place NW.

Maryland Avenue northeast of Twenty-eighth Street NE.

South Dakota Avenue northwest of Twentieth Street NE.

Underwood Street between Third and Fifth Streets NW.

Widening of Third Street between Tuckerman and Whittier Streets NW.

Forty-fourth Street between Yuma and Albemarle Streets NW.

Forty-fifth Street between Windom and Alton Places NW.
 Yuma Street between Forty-third and Forty-fourth Streets NW.
 Albemarle Street west of Forty-second Street NW.
 Fourth Street between Hamilton and Kennedy Streets NW.
 Kansas Avenue between Hamilton and Ingraham Streets NW.
 Hamilton Street between Fifth Street and Kansas Avenue NW.
 Ingraham Street between Fifth Street and Kansas Avenue NW.
 Jefferson Street between Fourth and Fifth Streets NW.
 Kennedy Street between Fourth and Fifth Streets NW.
 Sixth Street south of Chesapeake Street SE.
 Michigan Avenue (relocation and straightening).
 Meigs Street west of Trinidad Avenue NE.
 Forty-ninth Street south of Murdock Mill Road NW.
 Yuma Street west of Forty-ninth Street NW.
 Forty-second Street from Washington Place to Benning Road NE.
 Benton Street between Thirty-ninth and Fortieth Streets NW.
 W Street between Thirty-ninth and Fortieth Streets NW.
 Fortieth Street between W Street and Calvert Street NW.
 Varnum Street between Twelfth Street and Sargent Road NE.
 Widening Rockwood Parkway east of United States Reservoir NW.
 Widening Nebraska Avenue west of Rittenhouse Street NW.
 Quebec Street east of Connecticut Avenue NW.
 Thirty-sixth Street and Yuma Street NW.
 Shepherd Street between Thirteenth Street and Thirteenth Place NE.
 Eighth Place north of South Avenue NE.
 Devonshire Place at Connecticut Avenue NW.
 Park Drive SE. at Square 5657.
 Concord Avenue east of Ninth Street NW.
 Tuckerman Street between Thirteenth and Fourteenth Streets NW.
 Twenty-fifth Place south of Benning Road NE.
 E Street at Twenty-fifth Place NE.
 Sheridan Street between Fourteenth and Sixteenth Streets NW.
 Kansas Avenue north of Ingraham Street NW.
 Jefferson Street west of Third Street NW.
 Kennedy Street between Third and Fourth Streets NW.
 Third Street between Kansas Avenue and Kennedy Street NW.

Surveys have been made and recommendations forwarded for the opening of Maryland Avenue NE. and Foxhall Road and Prospect Street NW. It is very important that these extensions be made without delay. These projects are in line with active development, and there is serious danger of improvements being made in their lines which would add tremendously to the cost or might even prevent their ultimate extensions or widening.

HIGHWAY PLAN

A number of changes have been made in the highway plan and more are being considered. In connection with the opening of streets in accordance with the highway plan it frequently develops that parcels of land are so cut that the remaining parcel is of little value, and it is believed that the commissioners should have authority

granted for excess condemnation. This, of course, would require legislation. Many other municipalities have such authority, and nowhere would it be more beneficial than in the District, where we have a definite street plan.

If excess condemnation is applied in many of our street condemnation cases, the District would suffer no financial loss by such a procedure, as the irregular remaining parcels could be consolidated and sold at a substantial profit.

In opening streets they frequently are extended through subdivisions made prior to the adoption of the highway plan, and the layout is often irregular and ill shaped, and no private interests can adjust them to the permanent street plan. The only way to correct this and make this class of property conform to an orderly development in accordance with the approved street plan is for the commissioners to have the right of excess condemnation.

In the development and beautification of the District it is believed that portals or some distinctive treatment should be made where the main highways cross the District line, such highways being Sixteenth Street, Massachusetts Avenue, Wisconsin Avenue, Georgia Avenue, Rhode Island Avenue, Alabama Avenue, and Bladensburg Road.

One eyesore in the development of the street plan for the District of Columbia is the condition generally of the public parking between the building line and the sidewalk. This is frequently neglected by the abutting property owners, and there are few improvements which would beautify the city more than a proper landscaping of this parking. Thousands of dollars are spent for our parks, while the street parking along the public highways, which is exposed to the view of the general public traveling along these thoroughfares, is left totally unkempt. Hundreds of examples could be cited where such a condition exists. Many of our States beautify the sides of their State highways, and yet the National Capital neglects this important feature.

It seems that too much attention is given to utility and none whatever to beauty, and it is believed that more emphasis should be placed on the matter of beautification of our highways.

CONDEMNATIONS

This office prepares descriptions and plats, making the necessary surveys and computations in connection therewith, to be filed with the petitions in all condemnation cases instituted by the District.

During the past year there were 45 cases pending in court. Of this number 37 were miscellaneous cases (streets, school sites, playground sites, etc.), and the remaining 8 were alley cases. Of this number, 22 cases were filed in court during the past year.

There were five cases confirmed during the past year, four of these being alley cases.

In addition to the cases already filed in court, there were five cases ordered by the commissioners but not yet filed.

A table showing the status of all condemnations pending in court and filed by the commissioners for the past year is on file in this office.

REVISION OF THE HIGHWAY PLAN

The appropriation for the survey and revision of the highway plan, amounting to \$3,000, has been used to carry on this work. The service of employees for this work is continual, and it is believed that the two employees now carried on the rolls under this appropriation should be transferred to the annual roll as permanent employees and the work performed hereafter in connection with the regular work of the office.

CONDEMNATION OF STREETS, ROADS AND ALLEYS, AND SMALL PARK AREAS

An appropriation has been made in recent years amounting to \$5,000 for the purchase or condemnation of streets, roads, and alleys, and for the condemnation of small park areas at the intersection of streets, avenues, or roads in the District of Columbia.

This appropriation is entirely too small to be used to any advantage for the acquisition of park land, but has been found very advantageous in the purchase of small parcels for the widening of streets and alleys at sharp turns or intersections.

It is the belief of this office that if this appropriation is not materially increased it should be used only for the purpose of acquiring additional land for alleys and streets. Many dangerous intersections have been relieved during the past year through the use of this appropriation in making purchases of small parcels at alley and street intersections, and the appropriation should be continued.

PROPERTY OWNED BY THE DISTRICT OF COLUMBIA

This office has on file approximately 2,000 deeds from private parties to the District of Columbia for school and playground property, rights of way for sewer and water mains, etc., and the number is being increased annually as the District acquires additional property for this purpose.

There is, however, no record in map form of this property owned by the District, and it is believed that all such property should be platted in books of record and indexed similar to the subdivision record books covering private property.

To assemble this information and draw the plats to agree accurately with the descriptions in the deeds, and make the necessary index to cover same, would require an appropriation to be used to pay for such services and supplies as may be necessary to do this work.

M. C. HAZEN, *Surveyor*.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF TREES AND PARKINGS

AUGUST 21, 1929.

SIR: I have the honor to submit the following report of the operations of the trees and parking department for the fiscal year ended June 30, 1929.

TREES PLANTED

There were 4,238 young trees planted in their permanent positions on the streets during the fiscal year, a net increase of 1,402 over the previous year. A special effort made during the year to replace trees in the vacant spaces in the established lines resulted in 1,809 being planted to replace trees that were removed several years ago. An effort to extend the tree system along the streets in the suburbs and hitherto unplanted localities resulted in 2,247 being planted along many improved thoroughfares, 178 to replace trees that were removed in connection with street-widening work, and 4 trees were planted to replace trees removed because they interfered with sewer-construction work. Of the total number planted, 4,226 were set at the curb line and 12 in the parking between the inner edge of the sidewalk and the building line. The work of preparing the tree spaces for planting is vigorously prosecuted throughout such times of the year as it is found practicable to so distribute the force. Ordinarily no holes are dug between May 1 and September 1, the men then being employed in cultivating young trees, mowing weeds, trimming, and spraying trees.

The cost of planting 4,058 trees was paid from the appropriation for the trees and parking department, and includes the planting of trees in 59 tree holes that were dug and filled with good topsoil by private individuals without any cost to the District of Columbia. The entire cost of planting 52 trees was paid from the miscellaneous trust fund deposits of private individuals; 127 from the appropriations of other departments. A permit was granted to plant one tree at the curb line without any cost to the District.

It has been impossible to obtain trees from our nurseries in sufficient numbers to keep pace with the rapid growth of the city and its street improvements in the past few years. Last fall it was necessary to purchase 1,500 Norway maple trees (*acer platanoides*) approximately 8 to 12 feet high from a private nursery for street planting. It is, however, believed that if we are permitted to retain the present nurseries, it will only be a short time before they will produce the required number of trees to meet our demands and it will not be necessary to purchase any nursery stock. The sum of \$30,717.42 was expended from the appropriation for the fiscal year 1929 for labor and materials for tree planting along the streets. Some of the lumber for tree boxes, stakes, nails, and hose for strapping the young trees was purchased during the fiscal year 1928, and this material was used for planting during the fiscal year 1929.

TREES REMOVED

A total of 2,468 trees were removed during the year for various reasons. Of these 540 were decayed and dangerous, 13 condemned varieties, 7 were to relieve excessive shade, 13 because they interfered with parking improvements, 477 for street improvements, 37 for driveways, 18 for alley improvements, 26 were destroyed by automobiles, 288 were destroyed by storms, 4 interfered with vehicular traffic, 3 interfered with entrances to buildings, 3 because of close proximity to buildings, 100 interfered with building operations, 6 interfered with street lamps, 12 interfered with the proper development of curb trees, 5 interfered with the construction of sewers, 4 interfered with

the construction of a bridge, 2 interfered with the moving of a house, and 1 interfered with the construction of a conduit. It was ascertained that 117 were killed by illuminating gas, 11 by salt water, 117 by abnormal moisture, 76 by being filled around, 20 by being girdled, 3 by drought, 1 by insects, 3 by oil, 2 by fire, 31 by root mutilation, and the deaths of 528 were unexplained. Of the total number removed, 2,032 stood at the curb line, 327 in the parking, 53 in the sidewalk, 38 in alleys, 14 in roadways, 1 in playgrounds, and 3 from private property because of their dangerous condition and consequent hazard to the public.

The cost of removing 1,786 trees was paid from the appropriation for this division, 513 from the appropriations for other departments, and 37 from whole cost deposits. Permission to remove 132 trees was granted private individuals. The cost of removing the trees paid from the trees and parking department appropriation amounted to \$13,290.31.

NURSERIES

The Fort Dupont and Poplar Point nurseries are well stocked with small trees of the varieties considered best for street planting.

This department transplanted 1,863 sycamore maple, 2,223 sugar maple, 1,099 Norway maple, and 684 American elm seedlings to the nursery rows at Fort Dupont nursery, and 3,045 sycamore maple, 1,865 sugar maple, 827 ginkgo, 2,487 American elm, 415 Japanese elm, 840 sweet gum, 714 red oak, and 1,048 Spanish water oak seedlings to the nursery rows at Poplar Point nursery during the fiscal year. It will be several years before they will be suitable to be transferred to the street, and in the meantime they will have to be cultivated and pruned each year in order to become healthy specimens at the time of transplanting to the streets.

The sum of \$14,616.64 was expended for labor, teams, fertilizer, etc., for nursery work.

The sum of \$472.77 was expended for miscellaneous repairs to buildings at Fort Dupont, telephone, and electric-light service, and the sum of \$319.50 was expended for miscellaneous repairs to building at Poplar Point nursery.

This department was compelled to vacate its storeroom and shops located on reservation No. 13, in the Gallinger Hospital grounds, and the move was completed on April 27, 1929. All tools, supplies, equipment, and machinery has been transferred to a temporary building at Poplar Point nursery.

TRIMMING

Street trees require a great amount of trimming to prevent their encroachment on buildings and their interference with street and sidewalk traffic. It is necessary for the reasons stated to undertake the trimming of many trees, but this operation is not in all cases best for the welfare of the tree. The silver maple trees are responsible for the largest outlay in trimming. This species was planted years ago to the exclusion of many kinds whose subsequent use proved more advantageous. This tree as a street variety is noted for the early decay of its branches. It requires close attention to keep it in proper condition. Two small forces of men accomplished

much trimming on individual requests for trimming trees possessing objectionable or dangerous limbs and low limbs on young trees that seriously interfered with pedestrians and vehicular traffic. A total of 14,737 trees were trimmed during the year at a total cost of \$12,252.10.

In addition to the work performed on the individual requests for trimming, the same force attended to the miscellaneous casualties to trees and tree boxes reported by the police department. This casualty work is expensive due to its scattered nature. This work was performed at a total cost of \$793.14.

The sum of \$1,540.94 was expended in removing broken limbs, trees, etc., from the streets caused by storms.

TREES SPRAYED

Street trees, like all other forms of vegetation, are subject to attacks of insects and diseases. The trees of this city suffer each year from these insects, principally the elm-leaf beetle, the tussock moth, and the fall webworm. The life of the deciduous tree attacked by leaf-eating insects is directly endangered by them only when they keep the tree in a state of complete defoliation for several years in succession. Nevertheless, aside from disfiguring the tree for the season, defoliation tends to reduce its vitality. This often leads to attack by other insects, principally bark and wood borers, which frequently result in fatalities to the infested trees.

This department has sprayed 35,978 trees during the year for the extermination of leaf-eating insects. This work was performed at a total cost of \$2,458.92. This amount includes the sum of \$707.35 for arsenate of lead and cup grease that was purchased during the fiscal year 1928. The amount expended from the appropriation for 1929 was \$1,751.57. The sum of \$13.75 was expended for nicotine sulphate to exterminate the aphids or plant lice.

In addition to the above spraying, it was found necessary to spray 1,811 trees along the streets with oil for the extermination of scale. This work was performed at a total cost of \$267.60. This amount includes the sum of \$18.38 for oil that was purchased during the fiscal year 1928. The amount expended from the appropriation for 1929 was \$249.22.

CULTIVATING YOUNG TREES, REMOVING TREE BOXES, AND MOWING PARKINGS

A total of 21,809 young trees were cultivated during the year, at a total cost of \$4,865.51.

There were 429 tree boxes removed from the large trees throughout the city, at a total cost of \$173.39, and \$349.48 was expended in labor and hire of teams used in connection with the replacement of broken tree boxes, repair, and restaking boxes.

The sum of \$4,569.54 was expended during the year for the removal of weeds from uninclosed public parkings throughout the city.

The sum of \$47.42 was expended in trimming hedges around a reservation under the jurisdiction of the commissioners.

TREE SURGERY

Cavities are caused by any neglected injury to a tree through which the bark has been destroyed, thus allowing the wood to decay toward the center of the tree. The most common injuries result from neglect in treating wounds and removing stubs in pruning and failure to remove dead branches and those broken by storms. Treatment of cavities is inefficient unless all diseased wood is completely removed. The cavities in 11 elm, 3 Norway maple, 4 sugar maple, 8 linden, and 4 pin-oak trees standing at the curb line and 2 silver maples standing in the public parking were given attention. The sum of \$483.10 was expended from the appropriation for labor and materials.

REGULATION OF TERRACES AND RETAINING WALLS

This office issued 751 permits affecting the grades of terraces in connection with building operations in the residential districts during the year. The regulation of parking grades is proceeding very satisfactorily, and the public parking in the recently built-up sections of the city present a uniform appearance. The height of 456 retaining walls to be constructed on public space was passed on by this office.

SUMMARY

Curb trees on the streets at the close of the fiscal year 1928.....	106,565
Net increase in curb trees during the fiscal year 1929.....	2,194

Curb trees on the streets at the close of the fiscal year 1929.....	108,759
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Very respectfully,

C. LANHAM,
Superintendent Trees and Parking.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE SANITARY ENGINEER

SEPTEMBER 3, 1929.

SIR: Following is a summary of the sewerage and sewage-disposal systems as of June 30, 1929.

Length of sewerage system (miles):

Main sewers.....	181.17
Pipe sewers.....	742.36
Total of the sewerage system.....	923.63
Length of the sewage-disposal system.....	40.28
Total length.....	963.91
Cost of the sewerage system.....	\$21,455,232.35
Cost of the sewage-disposal system.....	6,340,416.64
Total cost.....	27,795,648.99

The sanitary engineer wishes to take this opportunity to express his appreciation for the efficient service of the personnel of the department whose loyal cooperation has made possible the accomplishments of the year.

A brief résumé of the activities of the year follows:

OFFICE ENGINEERING

This division is made up of three sections—(1) office engineering in relation to the sewer department proper, (2) office and field engineering with relation to the work of the public-service corporations, and (3) the general clerical work of the entire department.

The duties of section (1) include all computing, designing, and drafting in connection with the development of the sewerage and sewage-disposal systems, engineering, drafting, and clerical work found necessary in collaboration with other departments and other divisions of the sewer department, all preparation of data and writing of indorsements on engineer department files referred to it, and the recording of office records closely allied to engineering work.

During the fiscal year the following work was performed under section (1): Incidental to 107 contracts, drawings, and specifications were prepared and proposals scheduled, 41 other drawings showing special work, such as minor pumping stations, junction and regulator chambers, special catch basins, sumps, coal conveyors, etc., were prepared; 82 miscellaneous plats covering basin work and minor extensions were made; 25 drainage areas, 6 of which were major projects, were prepared, involving finished maps indicating general and sub-areas as well as the collaboration of run-off and capacities; rainfall data on unusual storms were plotted and the effects on the sewerage system studied; 74 roadway schedules, involving 672 jobs and 202 sidewalk schedules, were studied, and, where desirable, new sewers or the replacement of old and defective sewers were recommended in advance of the proposed paving; 87 street-grade maps and 127 alley-grade sheets forwarded by the highway department, creating new or modifying existing grades, were studied and approved or disapproved according to their bearing on existing or future sewers; 19 cases concerning the opening and closing of alleys were studied for their effects on the sewerage system and approved or conditionally approved; 12 notices, accompanied by blue prints, carrying pertinent information, were forwarded to the assessor covering cases where assessment had become due because of the subdivision of parcel property; 22 rights of way, with accompanying plats, were prepared for the purpose of acquiring easements for sewer construction across private property; 10 working maps on a scale of 100 feet to the inch, covering outlying sections of the District and showing all streets, alleys, lots, grades, sewers, etc., were made; maps of this department were posted to date by the recording thereon of 207 cases of separate construction work and 827 subdivisions and splits; 2,069 plumbing slips were issued in connection with applications for building permits involving the erection of 2,047 dwellings and 99 apartment houses; permits were issued for the installation of 222 area drains and 87 garage traps; completion reports to the number of 553 were posted on the department's records and filed; blue prints were prepared and indorsements written on 1,115 jacketed engineer department files, 547 of which eventually carried ordered work and made necessary the preparation and forwarding to the assessor of 392 notices of pending sewer assessments; data were prepared and letters written answering 263 communications referred to this department; and card indexes reflecting all new construction, subdivisions, completion re-

ports, record sheets, area drains, Y branches, standard drawings, sewers construed as service sewers, rights of way, and subsoil drains were kept posted to date.

The duties of section (2) include the preparation of all permits for public-service corporations and private underground construction in public space, as well as the supervision of such work while in progress. All applications for permits for underground structures are carefully studied in order to avoid interference with existing underground structures and to assure the reservation of sufficient space for future underground developments, then forwarded to the coordinator and chief engineer for approval of cuts in connection therewith, before permits are prepared in this office. In some cases extensions of underground structures have been shifted from their proper lines, at the request of the highway department, in order to avoid undesirable cuts.

During the year 4,874 inspections were made in connection with the installation of various underground structures. Among the jobs which required special attention were:

GAS MAIN EXTENSIONS

Canal and Foxall Roads, Thirty-sixth to Forty-fourth Streets NW.
Georgia Avenue, Military Road to Kalmia Road NW.

Sixteenth Street, Alaska Avenue to Juniper Street NW.

Mount Olivet Road, Bladensburg Road to West Virginia Avenue NE.

Wisconsin Avenue, Macomb Street to Loughboro Road NW.

"Spring Valley," Indian Lane, Rockwood Parkway, Glenbrook Road.

CONDUIT EXTENSIONS

"Spring Valley," Indian Lane, Rockwood Parkway, Glenbrook Road.

Military Road, Forty-third Street, Ingomar Street, Georgia Avenue to Wisconsin Avenue.

Thirteenth Street, Iowa Circle to U Street NW.

Connecticut Avenue, M Street to Dupont Circle.

Snyders Lane and Tunlaw Road NW.

Twenty-second Street, Franklin and Douglass Streets NE.

Wisconsin Avenue, River Road to District of Columbia line NW.

Minnesota Avenue, Bennings Road to Sheriff Road NE.

STREET-WIDENING PROGRAMS

Water Street, Wisconsin Avenue to Thirty-third Street NW.

Tenth Street, F Street to New York Avenue NW.

H Street, Seventeenth Street to Pennsylvania Avenue NW.

Seventeenth Street, H Street to K Street NW.

Connecticut Avenue, M Street to Dupont Circle.

The activities of the fiscal year are summarized as follows:

Potomac Electric Power Co.:

Conduits laid, various sizes	_____miles	20.11875
Premises connected with electric conduits	_____	2,550
Manholes constructed	_____	1,144
Drains connecting manholes with sewerage system	_____	191

Chesapeake & Potomac Telephone Co.:		
Conduits laid, various sizes-----	miles--	12. 25473
Manholes constructed-----		196
Drains connecting manholes with sewerage system-----		8
Capital Traction Co.: Drains connecting manholes with sewerage system-----		3
Washington Railway & Electric Co.: Drains connecting manholes with sewerage system-----		1
Western Union Telegraph Co.: Conduits laid, various sizes-----	miles--	0. 06383
Postal Telegraph Co.: Manholes constructed-----		1
Gas light companies:		
Gas mains laid, various sizes-----	miles--	19. 64670
Premises connected with gas mains-----		1, 805

Charges for supervision and inspection of this work were as follows:

Potomac Electric Power Co-----	\$3, 343. 91
Chesapeake & Potomac Telephone Co-----	1, 443. 14
Washington Gas Light Co-----	1, 460. 64
Georgetown Gas Light Co-----	917. 91
Washington Railway & Electric Co-----	3. 00
Capital Traction Co-----	3. 00
Total-----	7, 171. 60

Work done by private corporations and individuals

Vaults constructed in public space-----	13
Fuel-oil tanks installed, various capacities-----	30
Gasoline and fuel oil fill pipes laid to curb-----	80
"Free air" hose lines for inflating auto tires-----	1
Private tunnels in public space-----	1
Steam lines across public alleys-----	1

WORK DONE FOR THE UNITED STATES GOVERNMENT

One 24-duct conduit, built under contract for the Architect of the Capitol, from United States Capitol lighting, heating, and power plant to the United States Capitol, via South Capitol and Canal Streets SE.

Work done by the water department, District of Columbia

Drains connecting fire hydrants, air valves, and watering troughs with sewerage system-----	14
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The map system is being steadily expanded. During the year 52 new 50 foot to the inch maps were completed, and the system now covers approximately 65 per cent of the privately owned property in the District. Extensive use is made of these maps and they are an ever-increasing source of information to the District departments and the various public service corporations and private companies.

Three thousand two hundred and sixty-two permits for underground construction were prepared, and 708 record sheets, showing the work in detail, were made to supplement the map and card records.

The duties of section (3) include the preparation of requisitions and vouchers, records of cost of day labor and contract construction, preparation of pay rolls and pay-roll analysis sheets, material and equipment accounting, control of department finances, preparation of estimates and data for their defense, and clerical work in connection with the records of the division of maintenance.

ports, record sheets, area drains, Y branches, standard drawings. sewers construed as service sewers, rights of way, and subsoil drains were kept posted to date.

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Tenth Street, F Street to New York Avenue NW.

H Street, Seventeenth Street to Pennsylvania Avenue NW.

Seventeenth Street, H Street to K Street NW.

Connecticut Avenue, M Street to Dupont Circle.

The activities of the fiscal year are summarized as follows:

Potomac Electric Power Co.:

Conduits laid, various sizes	-----miles--	20, 11875
Premises connected with electric conduits	-----	2, 550
Manholes constructed	-----	1, 144
Drains connecting manholes with sewerage system	-----	191

Chesapeake & Potomac Telephone Co.:		
Conduits laid, various sizes	miles	12.25473
Manholes constructed		196
Drains connecting manholes with sewerage system		8
Capital Traction Co.: Drains connecting manholes with sewerage system		
		3
Washington Railway & Electric Co.: Drains connecting manholes with sewerage system		
		1
Western Union Telegraph Co.: Conduits laid, various sizes	miles	0.06383
Postal Telegraph Co.: Manholes constructed		1
Gas light companies:		
Gas mains laid, various sizes	miles	19.64670
Premises connected with gas mains		1,805

Charges for supervision and inspection of this work were as follows:

Potomac Electric Power Co.	\$3,343.91
Chesapeake & Potomac Telephone Co.	1,443.14
Washington Gas Light Co.	1,460.64
Georgetown Gas Light Co.	917.91
Washington Railway & Electric Co.	3.00
Capital Traction Co.	3.00
Total	7,171.60

Work done by private corporations and individuals

Vaults constructed in public space	13
Fuel-oil tanks installed, various capacities	30
Gasoline and fuel oil fill pipes laid to curb	80
"Free air" hose lines for inflating auto tires	1
Private tunnels in public space	1
Steam lines across public alleys	1

WORK DONE FOR THE UNITED STATES GOVERNMENT

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Work done by the water department, District of Columbia

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The map system is being steadily expanded. During the year 52 new 50 foot to the inch maps were completed, and the system now covers approximately 65 per cent of the privately owned property in the District. Extensive use is made of these maps and they are an ever-increasing source of information to the District departments and the various public service corporations and private companies.

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The duties of section (3) include the preparation of requisitions and vouchers, records of cost of day labor and contract construction, preparation of pay rolls and pay-roll analysis sheets, material and equipment accounting, control of department finances, preparation of estimates and data for their defense, and clerical work in connection with the records of the division of maintenance.

Requisitions were prepared and approved for the purchase of supplies, tools, and equipment for construction work amounting to \$129,357.33 and for construction material amounting to \$216,098.50, and vouchers were recorded and approved for payment therefor upon delivery.

Pay rolls were prepared, audited, and approved for payment, aggregating \$601,203.42.

Contract construction vouchers were audited and approved for an aggregate of \$705,062.52. The highway department was paid \$98,799.25 for resurfacing over sewer construction work. As a means of reference, all the foregoing expenditures were recorded by a card record system.

Complete ledger control was maintained over all appropriations throughout the year and balances in the various appropriations were computed semimonthly and checked with the auditor. At no time during the year did the expenditures exceed the apportioned allotments made the 1st of July, pursuant to the provisions of the "anti-deficiency act."

Financial statements were prepared monthly to permit a study of available balances, and through a study of these statements an orderly program of expenditures was arranged, and the expenditures were kept within the limits allotted and an overobligation at the close of the year avoided.

Daily record of all issues of street-car transportation and postage was maintained and detailed reports prepared monthly.

Daily reports were prepared and submitted to the sanitary engineer covering the construction work in progress on the sewerage system and the sewage-disposal system, operation, maintenance, and repair of the sewerage system and sewage-disposal system, pumping stations, shops, yards, and the supervision and inspection of sub-surface construction work in progress by various public-service corporations.

In connection with a survey of the disposition of waste crank-case oils, both local and general, made by the maintenance division, the section prepared and distributed 380 copies of the resulting report, which had been requested.

Nineteen classification sheets were prepared for appointments and transfers and forwarded to the personnel board.

A total of 90,521 reports were handled by this section during the year, while the total expenditures by the department were \$1,740,521.02.

CONSTRUCTION

The work of this division includes three sections—(1) surveys, (2) supervision and inspection of all sewers built under contract, and (3) construction by day labor of all minor sewers and their appurtenances.

The duties of section (1) include preliminary and detailed survey work in connection with office studies and design and procuring of necessary field data incidental to sewer construction.

Fifty-six assessment plats showing construction of service sewers abutting assessable property were prepared and forwarded to the assessor; the construction of 222 area drains and 87 garage traps were inspected and card indexed, 207 grade sheets for work done

during the year have been drawn up and filed; 179 measurement sheets for work done under contract were made during the year and copies for future reference filed; 39.64 miles of profile were run and plotted, and 87 contracts were worked upon and completed.

The duties of section (2) include the supervision and inspection of sewers constructed under contract.

The 87 contracts completed during the year were divided as to section, length, and cost as follows:

Section	Length (feet)	Cost
County west of Rock Creek.....	38, 799. 58	\$222, 198. 82
County east of Rock Creek.....	19, 239. 33	277, 169. 86
County west of Anacostia River.....	4, 529. 68	38, 163. 83
County east of Anacostia River.....	36, 555. 95	148, 760. 22
Washington City.....	18, 887. 94	197, 796. 56
Total.....	118, 012. 48	884, 089. 29

The year ended with work in progress on 17 contracts and with 35 contracts awarded on which no work had been done.

The duties of section (3) include the construction of minor sewers and their appurtenances and storm-water catch basins by day labor.

The section constructed 22,851.16 feet of sewers during the year. Sections, length, and cost are as follows:

Section	Length (feet)	Cost
County west of Rock Creek.....	6, 349. 29	\$24, 961. 56
County east of Rock Creek.....	5, 909. 90	31, 901. 62
County west of Anacostia River.....	4, 947. 28	20, 569. 50
County east of Anacostia River.....	3, 219. 39	14, 008. 08
Washington City.....	2, 425. 30	17, 057. 76
Total.....	22, 851. 16	108, 498. 5-

There were also constructed by day labor 631 standard catch basins, 123 elongated catch basins, 12 special catch basins, 10 alley catch basins, 215 manholes, and 2 bulkheads in sewers. Forty-two standard catch basins were reconstructed, 3 sewer manholes adjusted to line and grade, 5 manhole frames and covers set, 106 house laterals disconnected and reconnected, 58 Y pipes inserted in sewers, 59 test holes sunk, and 8 basins reconnected. There were 127 catch basins and 41 manholes abandoned.

Service sewers constructed under contract and day labor totaled 102,957.09 feet, costing \$508,024.83 and serving 856 houses. These figures show the average length of sewer for each house served to be 120.28 feet, at an average cost of \$593.49 per house, an increase of some 9 feet in length per house over the previous year.

MAINTENANCE AND OPERATION

The work of this division is divided into three sections—(1) maintenance of sewers, (2) operation of the pumping stations, (3) department transportation.

The duties of section (1) include the cleaning of catch basins; attention to complaints; cleaning and flushing of pipe sewers; inspection of tide gates, regulators, sumps, and screens operated in connection with the sewers; inspection of the interior of trunk sewers; collection of data on rainfall and flow in sewers; and assisting the refuse division in the removal of snow.

The 5,249 catch basins in the city proper were cleaned on an average of once each 33 days, a total of 55,488 cleanings for the year, removing 9,370 cubic yards of silt at a total cost of \$31,511.09. The 3,022 catch basins in the county were cleaned on an average of once each 52 days, a total of 14,488 cleanings for the year, removing 3,245 cubic yards of silt at a total cost of \$13,662.10. In connection with this activity, but not included in the above statement, 692 cubic yards of silt were removed from garage traps and 145 cubic yards of silt were removed from the ink chambers of the Bureau of Engraving and Printing.

Although rainstorms of unprecedented severity occurred during the year and there was a net gain of 649 catch basins, the number of basins obstructed was 342 against 344 the preceding year. This improvement is attributed to the street improvements and the gradual change from stench-box to gooseneck connections.

During the year 2,758 complaints were received, approximately 75 per cent being investigated by the division, the remainder being connected with the work of other departments and pertaining to private property. These complaints were classified as follows: 174 public sewers obstructed, 342 catch basins obstructed, 93 foul odors from catch basins, 59 dead animals in catch basins, 307 basin tops broken, 110 basin tops reset, 27 articles lost in basins and sewers, 489 obstructed house connections, 256 broken manhole covers, 1 accident, 451 flooded cellars, 1 broken alley grate, and 448 miscellaneous complaints.

The abnormal increase in the number of flooded cellars and basements over the number for previous years was due to four unusually heavy rainstorms. Other changes are normal.

A total of 69.1 miles of pipe sewers were cleaned during the year, 390.3 cubic yards of silt being removed. In connection with this pipe-sewer cleaning, 139 basin connections were cleaned, 683 house connections tested, 182 old sewers were examined.

Two thousand eight hundred and sixty miles of pipe sewers were flushed, 174 obstructions being removed and 41,929 manholes were flushed during the year.

The 107 tide gates, 17 regulators, 127 sumps, and 6 screens operated in connection with the sewers were inspected a total of 13,895 times during the year.

No inspection of the interior of trunk sewers was made during the year with the exception of a special inspection of the east side interceptor. This sewer was reported on last year as being attacked by sulphates, and the United States Public Health Service is now supervising a survey to determine whether or not certain detrimental elements are yet active.

The division maintained 14 automatic rain gages and 164 sewer-cup gages during the year.

The city was visited by four particularly heavy rainstorms during the year, one on August 11 and 12, 1928, showing a total precipitation of 7.31 inches, breaking all previous records for 24 hours by 0.02 of an inch. The storm of August 25, 1928, showed a total precipitation of 3.49 inches at the District Building. The precipitation of June 28, 1929, showed an average over the city of 0.87 of an inch in 17 minutes.

The storm of June 22, 1929, was of record intensity. The rate of precipitation during periods of 15, 30, and 60 minutes were considerably higher than the maximum rates of all storms of record, resulting in an overcharging of the sewers and consequent flooding of cellars. This was the only storm of record covering 32 years in which the rate of precipitation for periods of 5, 10, 15, 30, and 60 minutes consistently held above the design curve used by the District as a basis of construction.

Only one snowstorm of sufficient intensity to warrant dumping in the sewers occurred during the year—that of February 20–21, 1929—when 17,014 cubic yards of snow was disposed of through the sewers at various points.

As a result of the survey made by this section on the disposal of garage trap cleanings, it has been recommended that the department discontinue this work and that the plumbing regulations be amended to require public filling stations to maintain garage traps, and that these garages and repair shops be required to provide separate containers for the retention and disposal of waste crank-case oil; also, it has been recommended that contract be entered into for the collection and disposition of this used crank-case oil.

The duties of section (2) include the operation of the steam-driven main sewerage pumping station and the three electrically operated substations; the supervision of machine shop, blacksmith shop, carpenter shop, and paint shop, operated in connection with the pumping stations, and keeping of records in the study of station performance.

The total pumpage at the stations during the year was as follows:

	Gallons
Main station.....	30, 211, 645, 000
Poplar Point.....	1, 318, 403, 348
Rock Creek.....	1, 341, 848, 000
Earle Place.....	487, 870

Eliminating the last two stations, which deliver their discharge to the main station, the above figures show a mean total daily pumpage of 86,383.694 gallons, approximately 3,000,000 gallons per day greater than the previous year.

The total consumption of coal at the main station for the fiscal year was 4,256 tons, of which about 8 per cent should be charged to uses by the incinerator, blacksmith shop, and bunker losses.

There were removed from the sediment chamber at the main station 1,577 cubic yards of silt and from the sediment chamber at Poplar Point 410 cubic yards; 849.08 tons of débris were removed from the screens, pressed and incinerated; 4.23 tons of débris were removed from the skimming tank and incinerated; 340.62 tons of ashes were removed from the boiler ash pits and 71.76 tons of ashes from the

incinerator. All silt and ashes were deposited on the flats of the Anacostia River.

There was only one period of high water in the Potomac River during the year, when the spring freshet culminated on March 7, 1929, with a maximum of 101,750 second-feet. The minimum flow of 1,650 second-feet occurred on the 10th of November. The mean flow for the year was 12,296 second-feet. The maximum range of the tide in the Anacostia River as registered by an automatic gage was 7.7 feet, the maximum range for one day being 6.2 feet.

The duties of section (3) include the supervision and maintenance of all department transportation, manufacture of basin tops, the upkeep of grounds, and the maintenance of all internal-combustion equipment.

There were maintained during the year 68 automobiles, 21 being classed as passenger-carrying machines and 47 being trucks and light delivery classes; 3 tractors, 2 air compressors, motors on 2 tugs, concrete mixers, and gasoline portable pumps.

The mileage of all automobiles totaled 493,701.

During the year 1 roadster, 1 coupe, 1 sedan, and 3 basin-cleaning trucks were replaced.

The concrete shop turned out 1,102 basin tops, 643 drip stones, 1,283 cheek blocks, and 1,247 invert blocks. This represents an increase of 52 per cent over the work of the previous year.

The grounds of all pumping stations were kept in excellent condition, and all lawns and yards damaged by the department construction work were reconditioned.

Only 20 automobiles of the 68 in service are properly housed in closed garages. Garage space to properly protect the remaining 48 cars from the weather is most urgently needed.

J. B. GORDON,
Sanitary Engineer.

To the ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT

AUGUST 28, 1929.

SIR: The annual report of the activities of the water department for the fiscal year ended June 30, 1929, is submitted herewith. Reports of the various subdivision heads are not included, due to limited space, but are on file in this office.

The total length of cast-iron water mains of various sizes laid during the fiscal year was 116,122 linear feet, or 21.99 miles, about 1.35 miles more than the preceding year.

The total length of water mains in the system of all sizes is 794.15 miles.

The mean daily water consumption for the year was 73,567,771 gallons. The mean daily per capita consumption was approximately 133 gallons. The total consumption for the fiscal year was 26,852,236,560 gallons. This is an increase in consumption of 1,719,807,160 gallons over the total for the last fiscal year.

The mains at street intersections in 67 locations in the city were rearranged. In most cases this work was undertaken in advance of paving or highway improvements or repairs.

The new water tower at the Reno Reservoir was put in service during the year. The addition of this storage facility has enabled the extension of the fourth high service to be carried out. The supply main of 36-inch diameter to the new Reno Reservoir was laid. The 20-inch diameter drain for the reservoir was also placed by the water department. The area supplied by the fourth high service was materially increased. The service now available to the new area guarantees proper pressure and adequate protection.

Over 3,000 service pipes were found broken and leaking. Of this number, approximately 1,300 were cut off principally to enforce repairs. Leaking joints in excess of 1,000, and 93 broken mains were repaired.

Trunk mains authorized by special act of Congress were completed as follows: 36-inch main in M Street NW. from Eleventh Street to New Hampshire Avenue; 16-inch main in Wisconsin Avenue NW. from P to Reservoir Streets and Reservoir Street from Wisconsin Avenue to Thirty-fourth Street; 12-inch main in Eighteenth Street NW. from F Street to Pennsylvania Avenue; 12-inch main in Georgia Avenue NW. from Fairmont Street to Park Road; 12-inch main in Tenth Street NW. from Pennsylvania Avenue to K Street. The completion of these mains by connecting existing trunk lines or reenforcing real-estate development areas marks a considerable step forward in unifying the supply system.

It had been intended to keep the 48-inch main over the old M Street Bridge in service until the new section was ready for placing in position. This would have enabled the Dalecarlia plant pumps to continue in operation on that main. The main over the bridge was first rendered unsafe and finally ruptured by the building operations. As a result of this, the main was capped and the section upon the old bridge removed.

The Bryant Street pumping station was called upon four times in the year to assist the new station at Dalecarlia. The occasions were as follows: Third high service due to a break at Forty-fourth and Van Ness Streets NW.; third high service at request of Dalecarlia due to changing valve from hand to motor operation; first high service due to perilous condition of main at M Street Bridge; first high service due to break at M Street Bridge.

The efficient maintenance of the department and its service has been due to the active interest displayed by the employees and divisional chiefs, to whom I express my gratitude.

D. W. HOLTON,

Acting Superintendent Water Department.

To the ASSISTANT ENGINEER COMMISSIONER.

DISTRIBUTION BRANCH

ENGINEERING AND CONSTRUCTION

The following trunk water mains authorized by special act of Congress were completed during the year:

1. A 36-inch main in M Street NW. from Eleventh Street to New Hampshire Avenue, a total distance of 5,900 feet. This main is for reinforcement of the first high service near the business section of the city and assures an ample supply in case of fire. During the coming

year this main has been authorized to be extended eastward from Eleventh Street to New Jersey Avenue NW.

2. A 16-inch main in Wisconsin Avenue NW. from P Street to Reservoir Street and in Reservoir Street from Wisconsin Avenue to Thirty-fourth Street, a total distance of 1,900 feet. This is a reinforcement main for the second high service through Reservoir Road to Conduit Road, thence northward to Little Falls Road, and now connecting a 24-inch main in P Street directly to an existing 16-inch main in Reservoir Street at Thirty-fourth Street.

3. A 12-inch main in Eighteenth Street NW. from F Street to Pennsylvania Avenue, a total distance of 900 feet. This main replaced an old 6-inch main considered too small to adequately supply the necessary water to a section rapidly growing with large buildings. All house services were connected with the new main, and it is now a connecting link from a 12-inch main at Pennsylvania Avenue to an old 12-inch main at F Street.

4. A 12-inch main in Georgia Avenue NW. from Fairmont Street to Park Road, a total distance of 2,800 feet. The laying of this main completed a connecting link of the second high service between Barry Place and Park Road, which was started some years ago, and thereby giving to this vicinity a much needed feeder line both for fire use and domestic service.

5. A 12-inch main in Tenth Street NW. from Pennsylvania Avenue to K Street, a total distance of 2,950 feet. This gravity main obtains its supply directly off a 30-inch trunk main in K Street and passes through the business section, connecting to a 12-inch main in Pennsylvania Avenue, and replaces an old 6-inch main, thereby giving a sufficient supply of water for domestic use and a protection against fire hazards.

EXTENSIONS TO EXISTING MAINS

The extensions to mains aggregate 25,833 feet of 12-inch pipe, 4,653 feet of 16-inch pipe, 5,403 feet of 24-inch pipe, and 5,744 feet of 36-inch pipe.

1. A 24-inch main in B Street NW. from Sixth to Seventeenth Streets, a total of 5,403 feet; a 16-inch main in Twelfth Street NW. from B Street to Pennsylvania Avenue, a total distance of 896 feet; a 12-inch main in Nineteenth Street NW. from B Street to Pennsylvania Avenue, a total distance of 865 feet. These three mains were laid preparatory to the building operations contemplated and in progress in the Government triangle area. These mains will supply the buildings housing Government activities according to the plans for concentrating the departments in this area. The demands from such an extensive increase of necessity required adequate assurance of water supply.

2. A 16-inch main in Rockwood Parkway NW. west of Indian Lane, a total distance of 890 feet; a 12-inch main in Glenbrook Road NW. west of University Avenue and east of Indian Lane and in University Avenue north of Rockwood Parkway, a total distance of 2,278 feet; a 12-inch main in Indian Lane NW. from Loughboro Road to Rockwood Parkway, a total distance of 437 feet. These mains will be a part of the trunk-line supply to a large area undergoing development. As subdivision and construction progresses in

this district these mains will eventually connect with the third high concrete main in Upton Street.

3. A 12-inch main in Division Avenue NE. from Foote Street to south of Blaine Street, a total distance of 2,841 feet, including Foote Street from Division Avenue to Fifty-third Street; a 12-inch main in Fifty-seventh Street NE. from Blaine to Dix Streets, a total distance of 1,264 feet. These mains constitute a portion of those designed toward the elimination of privies. While the principal necessity for this extension was for sanitary purposes, it gives proper potable water to a large district unsatisfactorily supplied previously and fire protection.

4. A 12-inch main in Military Road NW. from Twenty-ninth to Thirty-second Streets, a total distance of 1,727 feet. This main was laid in advance of paving improvement.

5. A 12-inch main in Sheridan Road SE. from south of Jasper Road and from Nichols Avenue eastward, a total distance of 4,480 feet. This main extension fills a long-needed demand of a populated area formerly only supplied by public hydrants on galvanized-iron small-bore pipe. This main enables houses to be individually supplied by services instead of forcing dwellers to carry water, often considerable distances, and affords fire protection.

6. A 12-inch main in Fifth Street NW. from New York Avenue to K Street, a total distance of 406 feet; a 12-inch main in Gallinger Hospital grounds, reservation No. 13 SE., a total distance of 838 feet. These mains were laid to supply large buildings and improvements in districts formerly inadequately supplied by existing mains.

REPLACEMENTS OF MAINS

1. An 8-inch main in Seventeenth Street NW. between I and K Streets, a total distance of 377 feet; a 12-inch main in Fifteenth Street NW. between I and K Streets, a total distance of 464 feet. These replacement mains were laid through a highly developed area previously served by old mains of inadequate size, having been designed for the needs of the time in which they were laid.

2. An 8-inch main in M Street NW. between Fourteenth and Fifteenth Streets, a total distance of 570 feet; a 12-inch main in Sixteenth Street NW. between Scott Circle and Q Street, a total distance of 1,522 feet; an 8-inch main in Ward Street NW. between New Hampshire Avenue and Twenty-second Street, a total distance of 526 feet. These replacements were made in advance of street improvements, and work can be accomplished at minimum cost when done under above conditions.

MISCELLANEOUS

1. A 20-inch main in Belt Road and Wisconsin Avenue NW. was relocated with a view to greater preservation and accessibility. The necessity arose with the rearrangement of roadway and street-car tracks preparatory to paving improvements.

2. A 36-inch main was laid at the Reno Reservoir (new) connecting the United States Government concrete main with the reservoir proper.

3. A 12-inch main in DeRussey Street between Chesapeake and Donaldson Streets NW. was abandoned.

4. A 20-inch drain was laid in Davenport Street to the (new) Reno Reservoir.

Office engineering and administration

Miscellaneous drawings and tracings made	304
Projects made	320
Engineers' notes posted and checked on 50-foot, 100-foot, and 300-foot scale maps and tracings	3,920
Intersection cards made	222
Intersection cards posted and checked	1,179
Cards forwarded to the assessor	504
Green connection cards made for registrar	65
Communications written	645
Reports written	454
	1,099
Permits passed	2,501
Location of water main given out	3,097
Water pressures computed and given out	274
Estimates made	406

Posted daily 50-foot, 100-foot, and 300-foot scale water-main maps and map tracings; posted daily the work in progress; worked on cards showing mains, valves, etc., at street intersections; worked on valve index; passed schedules of work to be done under the commissioners' orders; passed schedules of work to be done by the highway department; passed permits for terraces, copings, and driveways; miscellaneous lettering, estimates, reports, and general office work.

STEAM ENGINEERING

On July 1, 1928, the Bryant Street pumping station was put on a reserve basis, all pumping being taken over by the Dalecarlia pumping station. This effected a reduction in the operating force at Bryant Street to eight men. On April 22, 1929, the operating force was increased by two enginemen when pumping was started again on the first high service due to a break in the 48-inch main at Twenty-seventh and M Streets NW., which necessitated the District pumping for the consumption east of Rock Creek. Two 20 M. G. D. and one 30 M. G. D. pumps were operated when necessary to maintain the pressure on this service, and the pumps on the second and third high services were tested with steam once a week.

A 10 M. G. D. pump on the third high service was operated on July 12 to July 17 at the request of the Dalecarlia station, necessitated by a leak on the concrete supply main for this service near Forty-fourth and Van Ness Streets, and again on August 22 to maintain the pressure on this service while changing a valve from manual to motor operation.

Records of the daily consumption of water in the District, computed from data furnished by the Dalecarlia station and from readings taken at Bryant Street station, were kept.

The total consumption for the fiscal year just ended was 26,852,236.560 gallons, which is 1,719,807.160 gallons more than that of the previous year, or an average daily consumption of 73,567.771 gal-

lons. The greatest consumption for one day, June 18, 1929, was 94,210,000 gallons; the least consumption for one day, December 2, 1928, was 62,419,000 gallons.

For the fourth high service, water is pumped from the third high service reservoir at Reno to two standpipes by motor-driven centrifugal pumps. This station is operated by three enginemen, who work in 8-hour shifts. The water pumped for this service during the year amounted to 375,621,060 gallons, or a mean average of 1,029,098 gallons daily, or 403,620 gallons daily more than that for the preceding year, which is approximately a 64 per cent increase.

For the first and second high services in Anacostia, water is taken from the gravity service and pumped to elevated tanks by centrifugal pumps. This station is operated by four enginemen, who work in 8-hour shifts.

The consumption on the first high service in Anacostia during the year was 393,275,000 gallons, or a mean average of 1,077,465 gallons daily, an increase of 166,440 gallons daily over the preceding year, which is approximately an 18 per cent increase.

The consumption on the second high service in Anacostia during the year was 18,047,000 gallons, or a mean average of 49,443 gallons daily, an increase of 4,438 gallons daily over the preceding year, which is approximately a 9 $\frac{3}{4}$ per cent increase.

The new equipment purchased and installed by the water department during the year includes a new 3 M. G. D. motor-driven centrifugal pump installed at Reno and put in service October 13, 1928.

WATER SURVEY

The water survey division handled routine work on complaints during the year and various special investigations as noted herein. A total of 6,958 complaints were received, which was a slight reduction in the number received during the fiscal year 1928. As each of these complaints involved at least 2 inspections by emergency crews, a total of over 12,000 inspections were handled. Three thousand one hundred and seven service pipes were found broken and leaking. Notices were served on occupants, owners, and agents in these cases to have repairs made, and the necessary follow-up work was prosecuted in each case. The number of cases represents a slight increase over similar cases in 1928. It was necessary to cut off the supply to 1,357 premises, principally to enforce repairs. Sixty-three abandoned service pipes were found leaking and were disconnected, emphasizing the necessity of continuing the present policy of removing these connections at the time they are abandoned rather than permitting them to remain under pressure until broken or leaking. Activities of the emergency crews included the handling of leaks on meters, meter connections, taps, fire hydrants, valves, the investigation of sources of water in flooded cellars, obstruction of supply due to broken meters, the handling of 473 false reports, and assistance to the water registrar's office in turning on house supplies at night when that office is closed. One thousand seven hundred and sixty-three represents the total of the above-named cases.

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Leaking calked joints numbering 1,021 were uncovered and repaired, a slight increase over the number in 1928. Ninety-three broken mains were repaired, about one-third less than the number in 1928.

Construction work by this division increased substantially during the year and embraced the capping of water mains, relocating of fire hydrants, cutting out abandoned tees, relocating of blow-off valves, and insertion of tee connections.

This division removed 514 abandoned taps from the mains and made low-pressure investigations at 21 locations involving 24-hour pressure determinations with recorders. Electric light and power was furnished by portable generators on six construction jobs. Service was furnished to other divisions of the water department, to plumbers and to corporations in locating unrecorded mains and connection with electric pipe-locating equipment.

Experimental work and construction on improved flow meter was carried on during the year and plans started for the resumption of intensive water surveys for reduction of the large amount of unaccounted-for water, representing about one-third of the total supply.

Engineering services were rendered by the division in major departmental problems, including installation of new pumping and metering equipment at Reno Reservoir.

STOREKEEPING

The cost of operating the storerooms and storage yards for the year was 4.081 per cent of the value of material issued plus value of equipment disposed of. A comparison of the percentages of cost of operating the storerooms and storage yards for the past 15 years shows: From 4.676 per cent in 1915 to 4.081 per cent in 1929.

The total value of the material issued plus equipment disposed of during the year was \$525,470.93, and the total wages, salaries, and per diem paid employees of the storerooms and storage yards during the year was \$21,444.74.

During the year we received material having a cost value of \$525,760.64 and we issued material having a cost value of \$516,349.80.

The cost of equipment received during the year was \$15,237.11 and the value of equipment which was disposed of during the year was \$9,121.13. The value of material on hand at the end of the year was \$184,141.69 and the value of the equipment in stock and in service at the end of the year was \$763,470.04.

A complete inventory was taken during the year of all property, expendable and nonexpendable, owned by the department. The taking of this inventory necessitated the actual counting of all supplies and equipment.

TRANSPORTATION

The transportation equipment at the end of the year consisted of 52 automobile trucks and passenger cars, ranging in capacity from a 2-passenger car to a 5½-ton truck. The total number of trucks was increased by 2 during the year, and 4 old trucks were traded in as payment for 4 new trucks.

The cost of maintenance of operation of trucks during this period, according to statement furnished by the chief clerk, amounted to \$25,482.20.

Particular attention is invited to the low cost of operating the storerooms and storage yards and to the healthy financial condition of the general hauling account.

METER DIVISION

The meter division operated in the usual manner during the year, installing new meters on new services, removing and replacing defective meters, removing meters and casings from abandoned services, repairing and replacing defective meter connections, repairing and testing defective meters, and testing all new meters received from the manufacturers. The division also tested valves, cocks, fire hydrants, and gages for other divisions in the department.

More than 6,000 defective meters were removed, repaired, and replaced during the year. In connection with this work it was necessary to replace 600 meter connections, which were found corroded and leaking. These replacements were made with brass pipe and bent couplings, which will facilitate the changing of meters in the future.

There were removed for repairs 465 private meters, 422 of which were repaired and reset. The cost of this work was assumed by the owners of the meters.

REVENUE AND INSPECTION BRANCH

WATER RATES

The rate for domestic purposes is charged according to stories and front footage. On all tenements two stories high or less with front width of 16 feet or less the rate is \$7.03 per annum, in advance. For each additional front foot or fraction thereof greater than one-half, 44 cents additional. For each additional story or part thereof, one-third of the charges as computed above.

Business premises are rated according to their size, class, volume of business, and water facilities, the rate varying from \$1.41 to \$25. If the flat rate on business establishments reaches \$25 or more, the owner or occupant is required to install a water meter at his own expense.

A minimum rate of \$6.36 is charged against all consumers supplied with water through meters, which allows the use of 7,500 cubic feet of water during the year, water used in excess thereof being charged for at the rate of 6 cents per 100 cubic feet.

TABLE 1.—Statement of collections

Water rents:	
District of Columbia.....	\$1,314,861.08
Virginia	4,784.95
Total	1,319,646.03
Water-main tax, principal and interest.....	187,742.96
Miscellaneous receipts.....	423.85
Total collections.....	1,507,812.84

TABLE 2.—Table of cash receipts of the water-rent fund for the fiscal years from June 30, 1924, to June 30, 1929

Year	Water rents	Water-main tax, principal and interest	Miscellaneous receipts
1924.....	\$1,035,858.89	\$109,843.31	\$619.72
1925.....	1,023,603.98	141,089.86	935.42
1926.....	1,052,330.56	176,799.22	1,142.99
1927.....	1,286,025.90	164,592.58	1,219.24
1928.....	1,224,921.85	196,237.19	691.76
1929.....	1,319,646.03	187,742.96	423.85
Total.....	6,942,387.21	976,305.12	5,032.98
1930 (estimated).....	1,305,000.00	175,000.00	1,000.00
1931 (estimated).....	1,322,000.00	175,000.00	1,000.00

TABLE 3.—General information

Consumption of water through meters:	Cubic feet
District meters.....	660,000,000
District meters, municipal buildings.....	220,600,000
Private meters.....	1,035,000,000
Private meters, charitable institutions.....	29,100,000
Total.....	1,944,700,000

Meters in service	In use June 30, 1928	Installed, 1929	Abandoned, 1929	Total in use June 30, 1929
District meters.....	73,272	630	164	73,738
Municipal buildings.....	320			320
Private meters.....	4,782	333	32	5,083
Charitable.....	221	4	2	223
Fire service.....	482			482
Total.....	79,077	967	198	79,846

Average cost of reading meters.....	\$0.121
Average cost of computing and making bills.....	.193
Average payment for premises in which District meters are installed.....	7.54
Average payment, flat rate accounts.....	10.46

Water services:	
In use June 30, 1928.....	92,677
Installed, 1929.....	2,015
Total.....	94,692
Abandoned, 1929.....	381
In use June 30, 1929.....	94,311
Metered.....	79,846
Not metered.....	14,465
Percentage of services metered.....	84.6

TABLE 4.—*Cost of work done by the water department for the year ended June 30, 1929*

Heads of expenditures	Per diem and salaries	Material expended, cuts, and transportation	Total expenditures	Charge to general accounts		Hauling and deposit accounts, debtor
				Maintenance	Extensions	
Water survey (detection of leaks)	\$9,070.62	\$1,427.67	\$10,498.29	\$10,498.29	-----	-----
Maintenance of meters	44,331.97	20,725.19	65,057.16	65,057.16	-----	-----
Installation of meters	7,060.55	2,510.49	9,571.04	-----	\$9,571.04	-----
Office of Water Registrar	100,123.38	10,324.62	110,448.00	110,448.00	-----	-----
Inspection and repair of house services	19,926.83	2,775.78	22,702.61	22,702.61	-----	-----
Tapping water mains	5,366.07	5,527.54	10,893.61	-----	10,893.61	-----
New services installed	9,882.27	6,798.60	16,680.87	-----	16,680.87	-----
Engineering (field survey)	44,863.26	2,290.09	47,153.35	-----	47,153.35	-----
Transportation account	26,812.88	5,200.33	32,013.21	-----	-----	\$32,013.12
Operation and repair of valves, fire hydrants	34,647.81	6,579.65	41,227.46	41,227.46	-----	-----
Installation of fire and public hydrants	18,425.58	43,918.58	62,344.16	-----	62,344.16	-----
Water mains laid	228,740.40	312,434.33	540,563.68	-----	540,563.68	-----
Repair to leaks	47,937.98	12,521.31	60,459.29	60,459.29	-----	-----
Maintenance of reservoirs, lodges, and towers	810.40	569.78	1,380.18	1,380.18	-----	-----
Care of grounds	7,763.51	218.75	7,982.26	7,982.26	-----	-----
Repayment and deposit work	27,211.76	28,151.35	55,974.16	-----	-----	55,974.16
Replacement work, lowering mains, etc.	15,828.36	16,370.04	32,198.40	32,198.40	-----	-----
Plans, estimates, and tests	14,445.68	223.07	14,668.75	9,778.90	4,889.85	-----
Care of Bryant Street pumping station	18,065.92	2,055.24	20,121.16	20,121.16	-----	-----
Operation and repair of pumps, Bryant Street station	21,624.41	13,221.46	34,845.87	34,845.87	-----	-----
Operation and repair of pumps, Reno station	6,250.36	3,891.76	10,142.12	10,142.12	-----	-----
Operation and repair of pumps, Anacostia station	7,459.95	6,311.63	13,771.58	13,771.58	-----	-----
New pumping equipment	1,602.94	465.38	2,068.32	2,068.32	-----	-----
Shop work	25,504.31	34,892.88	60,397.19	60,397.19	-----	-----
Gross operating costs	743,757.20	539,405.52	1,283,162.72	503,078.79	692,096.56	87,987.37

SUMMARY

Operating costs:		Charge to—		Per cent
Per diem pay rolls	\$589,300.88	Maintenance	\$503,078.79	42
Salary pay rolls	154,456.32	Extensions	692,096.56	58
Total services	743,757.20			
Material expended, cuts, etc.	539,405.52			
Gross operating costs	1,283,162.72			
Less transportation and repayment credits	87,987.37			
Net operating costs	1,195,175.35		1,195,175.35	100

NOTE.—The above statement is exclusive of any funds expended on account of the Washington Aqueduct and filtration plant.

TABLE 5.—Statement of the distribution system, including mains laid by the United States, the District of Columbia, and on account of repayment work

	In service June 30, 1928	Laid during year ended June 30, 1929	Abandoned during year ended June 30, 1929	In service June 30, 1929
Diameter:				
3-inch.....linear feet.....	92,761	794.20	183.00	93,372.20
4-inch.....do.....	155,478	1,681.95	2,518.50	154,641.65
6-inch.....do.....	1,464,656	2,759.88	356.92	1,467,058.96
8-inch.....do.....	1,391,142	66,064.91	1,214.00	1,455,992.91
10-inch.....do.....	9,120			9,120.00
12-inch.....do.....	511,167	27,760.95		538,927.95
16-inch.....do.....	87,944	5,190.00		93,134.00
20-inch.....do.....	146,558	426.70		146,984.70
24-inch.....do.....	37,299	5,513.40		42,812.40
30-inch.....do.....	72,166	7.00		72,173.00
36-inch.....do.....	63,878	5,922.40		69,800.40
42-inch.....do.....	23			23.00
48-inch.....do.....	44,256			44,256.00
75-inch.....do.....	600			600.00
Total.....	4,077,048	116,121.39	4,272.22	4,188,897.17
Stop valves.....	13,242	748	225	13,765.
Fire hydrants.....	4,655	250	4	4,901
Public hydrants.....	299	14	2	311
Sanitary fountains.....	30	3	1	32
Public wells.....	39	0	2	37
Horse fountains.....	172	0	1	171

TABLE 6.—Statement of the length and cost of water mains laid from July 1, 1878, to June 30, 1929, paid from water department funds

	In service June 30, 1928	Laid during year ended June 30, 1929	Abandoned during year ended June 30, 1929	In service June 30, 1929
Diameter:				
3-inch.....linear feet.....	77,081		183.00	76,898.00
4-inch.....do.....	109,737		2,518.30	107,218.70
6-inch.....do.....	1,069,411		356.92	1,069,054.08
8-inch.....do.....	1,322,645	56,810.62	1,214.00	1,378,241.62
10-inch.....do.....	6,751			6,751.00
12-inch.....do.....	440,281	25,832.75		466,113.75
16-inch.....do.....	74,410	4,652.65		79,062.65
20-inch.....do.....	135,456			135,456.00
24-inch.....do.....	16,815	5,403.00		22,218.00
30-inch.....do.....	34,599			34,599.00
36-inch.....do.....	38,244	5,744.25		43,988.25
42-inch.....do.....	23			23.00
48-inch.....do.....	14,393			14,393.00
Total.....	3,339,846	98,443.27	4,272.22	3,434,017.05

Total cost to June 30, 1928.....\$6,833,492.69.

Total cost for the year ended June 30, 1929.....540,563.68.

Aggregate cost to June 30, 1929.....7,374,056.37